METEOROLOGICAL OFFICE
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MINUTES OF THE PROCEEDINGS

OF THE

METEOROLOGICAL COUNCIL

1901–1902.

LONDON:
PRINTED FOR HIS MAJESTY'S STATIONERY OFFICE,
BY DARLING & SON, LTD., 34-40, BACON STREET, E.

1903.

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1901-1902.

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MINUTES OF THE PROCEEDINGS

OF THE

METEOROLOGICAL COUNCIL.

1901–1902.

63, *Victoria Street*, *April 24th*, 1901.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	PROFESSOR DARWIN.
THE HYDROGRAPHER.	MR. SHAW (*Secretary*).

1. Read the following letter (M.O. 488) :—

M.O. 488.

The Royal Society,
March 26th, 1901.

SIR,

I AM directed to make known to you the following decisions of the President and Council of the Royal Society in regard to the Meteorological Council and Association.

The President and Council accept the resignation of Mr. Francis Galton as a member of Council, and, in doing so, wish to record their appreciation of his long and valuable services.

They nominate Sir Richard Strachey, Professor G. H. Darwin, Dr. Buchan, and Mr. Shaw to be, with the Hydrographer to the Admiralty, the Directors. They further nominate General Sir Richard Strachey as Chairman.

They have come to the conclusion that it will be desirable to appoint five other persons to bring up the number of members of the Association to ten, and for that purpose nominate as members the Earl of Rosse, Mr. J. Y. Buchanan, for a period of five years, and Mr. Dines, Professor Schuster, and Dr. R. H. Scott, for a period of three years.

They take it for granted that these additional five members will not be often required to attend meetings of the Council ; possibly one or two meetings a year, in addition to the statutory annual meeting, will be all that is desirable. And they are of opinion that these gentlemen should not receive any honorarium for their attendance. Indeed, they have reason to believe that their acceptance of a honorarium would present legal difficulties.

I am, &c,
M. FOSTER,
Secretary R. S.

The Secretary,
The Meteorological Council.

The Secretary was directed to write to the Royal Society respecting the communication of the decisions of the President and Council to the other members of the Meteorological Council nominated by them (P.C. 1,026).

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He was also directed to draft a letter expressing the Council's sense of their obligation to Mr. Galton for his services to the Office from its establishment in 1867.

2. The Minutes of the last meeting (March 26) were read and confirmed.

3. *Fishery Barometer*, Mallaig (Minute 10).—It was resolved on the report of the Fishery Board for Scotland (M.O. 613) to supply a barometer for Mallaig.

4. *Morning Telegrams to the Liverpool Journal of Commerce* (Minute 5).—It was agreed that a letter be sent (P.C. 974) explaining the conditions upon which the telegrams could be compiled in the Office and in the Post Office respectively, and that arrangements be made on the one plan or the other as preferred by the Journal of Commerce.

5. *Weekly Summary of the Weather for The Fish Trades Gazette* (Minute 8).—The Secretary reported that a tabular statement for 8 a.m. on Friday, April 19, and a daily summary of 8 a.m. observations for the week ending Thursday, April 18, had been supplied, but that the arrangement for future reports had not yet been completed.

6. *Finance.*—It was resolved that £1,500 be invested in the purchase of 2½ per cent. Consols as provision for superannuation allowances.

7. *Office Staff.*—The following increments to the Office Staff were allowed (Minutes 1900–1901, p. 3) :—

——	Salary in 1900-1901.	Proposed for 1901-1902.
	ANNUAL.	
CLASS III.—MAXIMUM £150.	£ s. d.	£ s. d.
R. F. Wallace (Minutes 1900, p. 23)	125 0 0	130 0 0
CLASS IV.—MAXIMUM £110.		
C. A. Bracey (Minutes 1890–1, p. 76)	105 0 0	110 0 0
E. J. Hood („ 1892–3, p. 66)	95 0 0	100 0 0
J. T. Williams („ 1896–7, p. 3)	80 0 0	85 0 0
BOY CLERKS.—MAXIMUM £1.	WEEKLY.	
A. T. Bench (Minutes 1897–8, p. 77)	0 17 0	0 18 6
H. Prickett („ 1899–1900, p. 98)	0 12 6	0 14 0
W. G. Eldridge („ 1900–1901, p. 14)	0 12 6	0 14 0

The salary of A. G. Goad (Messenger) was raised from 15*s.* 6*d.* to 17*s.* a week (Minutes 1898–9, p. 93).

8. *Annual Report.*—The Secretary was directed to prepare a draft of the Report for the year ended March 31, 1901.

9. *Observations at Noon G.M.T. during the Antarctic Expedition.*—The Secretary reported that, in reply to a communication from the German Committee to Sir C. Markham, he had given Commander Scott to understand that the Council would distribute Meteorological log books, of the form agreed upon by the German and English Committees, to observers on ships going south of Lat. 30° S., and otherwise facilitate as far as they could the collection of data for noon G.M.T. during the period of Expedition.

Approved.

10. *Observations on the Victoria Nyanza and Upper Nile.*—Read the following letter (M.O. 605) :—

M.O. 605.

1, Savile Row,
Burlington Gardens, W.,
2nd April, 1901.

DEAR SIR RICHARD STRACHEY,

YOUR letter of March 4th, with reference to observations on the Victoria Nyanza, has been under the consideration of the Council. I am desired to say that they will be glad to do what they can to forward the views of the Meteorological Council by publishing the observations referred to in the "Geographical Journal" as far as practicable.

May I ask you, therefore, to be good enough to give instructions that the observations be forwarded to me in the form in which it is considered desirable that they should appear in the "Journal."

It would no doubt be possible to give a simple outline map showing the positions of the places where the observations are taken.

I am, &c.,
J. S. KELTIE.

Also the following letter forwarded from the Foreign Office :—

M.O. 593.

Entebbe, Uganda,
January 17th, 1901.

MY LORD,

SIR HARRY JOHNSTON desired me to forward the enclosed information to your Lordship. It consists of meteorological records and nilometer readings at Fort Berkeley in the Nile Province of the Uganda Protectorate. Mr. F. Spire for some time past has been acting as collector for the Bari District, and has commenced under great difficulties a systematic method of recording the meteorological conditions, and the rise and fall of the River Nile at Fort Berkeley. The Special Commissioner has commended him for the trouble he has taken in the matter, and has encouraged him to continue these records without intermission.

The Special Commissioner has authorised Mr. Spire to communicate one set of readings direct to the British Agency, Cairo, thinking that it might be of use in connection with the other records which are sent of the rise and fall of Lake Victoria Nyanza in Uganda and other Provinces of the Uganda Protectorate.

I have, &c.,
J. F. CUNNINGHAM.

The Marquess of Lansdowne, K.G., &c., &c., &c.

The Secretary was directed to send copies of the Victoria Nyanza and Fort Berkeley observations to the Royal Geographical Society.

11. *Pilot Charts.*—Read letter (M.O. 518) from the Liverpool Underwriters' Association suggesting the inclusion of reports on derelicts in the charts, and stating that instructions had been given for any special Meteorological information received on Ship's Reports to be transmitted to the Office.

The Secretary was authorised to thank the Underwriters' Association for the letter (P.C. 991).

12. *Republication of Official No.* 59.—A memorandum from the Marine Superintendent was read, and it was agreed to obtain a specimen of the charts reproduced by photo-lithography at two-thirds of the linear dimensions of the originals.

13. *Barometer Room at Scilly.*—The Secretary reported (1) that he had been informed by Lieut.-Col. A. H. Kenney, R.E., C.R.E., Devon (M.O. 487), that possession of the room where the office barometers are kept at Scilly had been resumed from Mr. Dorrien Smith, and that the room was required for W.D. purposes, and that there was no W.D. building where a room could be appropriated permanently for the purposes of the office.

(2) That on receipt of this information he had applied to Lloyd's for permission for the Observer, who is Lloyd's signalman, to move the barometers to the Signal Tower, and that he had received permission (M.O. 639), and had given instructions to the Observer to carry out the removal.

Approved.

14. *Storm Signals at Ballantrae.*—The Secretary reported that he had supplied new halliards (price 3*s.* 9*d.*) to the Coastguard Station at Ballantrae for the signal cone to replace those supplied in 1899.

Approved, on the understanding that opportunity should be given for the Admiralty to express an opinion upon any further application of a similar character from a coast-guard station.

15. *Falmouth Observatory Anemometer* (Minute 12 of March 26).—Read a letter from Sir J. Fayrer to Professor Darwin in favour of providing a Dines anemometer. The Secretary reported that useful information as to the Falmouth winds and their registration by the Robinson anemometer installed there, could probably be obtained if a Dines anemometer with a 40-foot tube were erected there. That if the comparison of the two instruments showed that the exposure of the Robinson instrument was not a satisfactory one it would be desirable to remove it to another station and use the Dines instrument, with its greater elevation, instead.

It was resolved to ascertain whether if the Council supplied the apparatus the Falmouth observatory authorities would bear the cost of erecting it (P.C. 1,022).

16. *Cooper's Hill.*—Read letter (M.O. 521) from Professor McLeod announcing that he was giving up the charge of the Climatological Station at Cooper's Hill.

The Secretary was directed to convey to Professor McLeod the thanks of the Council for the long series of excellent observations contributed by him (P.C. 966).

The Secretary reported that in accordance with the suggestion in Professor McLeod's letter he had written (P.C. 999) to Colonel Ottley, President of the College, expressing the hope that arrangements might be made for continuing the observations.

Approved.

17. *Jersey.*—Read letter (M.O. 565) from the Rev. H. W. Yorke stating that he was leaving Jersey and discontinuing the supervision of the observations with the sunshine recorder, and suggesting that the Harbour Master, Capt. Renouf, should be asked to take his place.

The Secretary was directed to express to the Rev. H. W. Yorke the thanks of the Council for his assistance (P.C. 981).

The Secretary reported that he had concurred (P.C. 1,005) in the suggestion that Capt. Renouf should be asked to supervise the arrangements for the recorder.

Approved.

18. *Weekly Weather Report.*—It was resolved to continue to Dr. H. R. Mill the free copy of the Weekly Weather Report formerly supplied to Mr. G. J. Symons.

19. Read—A memorandum from the Marine Superintendent stating that since the last meeting 14 logs had been received, seven of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

20. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on 9 days, the total number of districts warned being 53.

In 19 districts the warnings were justified by subsequent fresh or strong gales (force 8 and upwards), and in 20 districts by moderate gales or strong winds (force 7 or 6). In 14 districts they were not required.

GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

A strong gale from S.E. and E. on the north-east coast of Scotland on March 30th, caused by a deep depression which advanced over our islands on the night of the 29th. At 6 p.m., 29th, the indications did not appear sufficiently serious to justify the extension of the warnings to that coast.

FREDC. GASTER.

Telegraphic Branch,
24th April, 1901.

21. Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of March, 1901 :—

The letters used have the following signification :—

a = complete success. | **c** = partial failure.
b = partial (*i.e.*, more than half) success. | **d** = total failure.

Districts.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	39	71	55	83
"	b	29	26	28	
"	c	32	0	16	
"	d	0	3	1	
Scotland, E.	a	45	65	55	84
"	b	32	26	29	
"	c	16	6	11	
"	d	7	3	5	
England, N.E.	a	61	68	65	87
"	b	29	16	22	
"	c	7	13	10	
"	d	3	3	3	
England, E.	a	49	52	51	88
"	b	32	42	37	
"	c	16	6	11	
"	d	3	0	1	
Midland Counties	a	61	68	65	88
"	b	20	26	23	
"	c	16	6	11	
"	d	3	0	1	
England, S.	a	52	55	54	87
"	b	32	35	33	
"	c	13	10	12	
"	d	3	0	1	
Scotland, W.	a	58	87	73	95
"	b	32	13	22	
"	c	3	0	2	
"	d	7	0	3	
England, N.W.	a	58	68	63	89
"	b	23	29	26	
"	c	16	3	10	
"	d	3	0	1	
England, S.W.	a	65	71	68	91
"	b	26	19	23	
"	c	6	10	8	
"	d	3	0	1	
Ireland, N.	a	52	78	65	86
"	b	26	16	21	
"	c	19	3	11	
"	d	3	3	3	
Ireland, S.	a	48	74	61	84
"	b	29	16	23	
"	c	23	3	13	
"	d	0	7	3	
Summary.					
British Islands	a	54	69	62	88
"	b	28	24	26	
"	c	15	5	10	
"	d	3	2	2	

22. The Secretary reported that Mr. A. H. Bell had returned to work in the Land room after an absence of six weeks on account of ill-health, and Mr. Francis in the Telegraph branch after an absence of eight days.

23. *Reports of Work.*—Submitted—The following reports of work during the month of March, 1901 :—

MONTHLY RETURN OF "A" INSTRUMENTS ON CHARGE.

31*st March*, 1901.

—	Barometers.	Aneroids.	Thermometers. Ordinary.	Thermometers. Maximum.	Thermometers. Minimum.	Thermometers. Solar Radiation.	Thermometers. Grass, Minimum.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
Dr.													
On charge, 1st March ..	45	102	72	75	69	—	—	44	45	2	—	—	
Received since ...	6	3	1	—	1	—	—	—	—	—	—	—	
	51	105	73	75	70	—	—	44	45	2	—	—	
Cr.													
Sent out during month	—	5	—	5	5	—	—	—	—	—	—	—	
On charge, 1st April ...	51	100	73	70	65	—	—	44	45	2	—	—	

20th April, 1901. R. F. WALLACE.

MONTHLY RETURN OF M.O. INSTRUMENTS ON CHARGE.

31*st March*, 1901.

—	Barometers.	Aneroids.	Thermometers. Ordinary.	Thermometers. Maximum.	Thermometers. Minimum.	Thermometers. Solar Radiation.	Thermometers. Grass, Minimum.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
Dr.													
On charge, 1st March...	35	6	130	7	6	7	4	26	91	7	2	11	1 Barograph and 3 Sunshine Recorder frames.
Received since ...	6	—	11	9	6	—	—	—	—	6	—	—	
	41	6	141	16	12	7	4	26	91	13	2	11	
Cr.													
Sent out during month	9	—	43	9	7	1	1	1	3	7	—	1	1 Barograph.
On charge, 1st April ...	32	6	98	7	5	6	3	25	88	6	2	10	3 Sunshine Recorder frames.

20th April, 1901. R. F. WALLACE.

MARINE BRANCH.

April 4, 1901.

Examined eight new logs and two lighthouse registers.

Obtaining monthly results of observations over the region south of the Equator, from the west coast of Africa westward to 90° W. Drawing wind-roses, preparing coastal wind charts for South America, and correcting proofs and revises of engraved charts.

Examining proofs of the lithographed North Atlantic and Mediterranean Pilot Chart for April; the May chart sent to the lithographer, and proof of the letterpress read; the June chart completed, and the one for July well advanced.

Examining, preparing, and extracting data in high southern latitudes for the use of the Antarctic Expedition.

Obtaining monthly meteorological results for various places in the South Atlantic and Bay of Bengal, for incorporation in the revised issues of the Admiralty Sailing Directions.

Assistance given to the Administrative Branch in postal work in connection with the issue of Marine publications; and to the Telegraph Branch in distributing Daily Weather Reports to the railway bookstalls.

Hydrographic extract from the log of the barque "Conway Castle," respecting a rock or reef in the Pacific Ocean, sent to the Admiralty.

CHAS. HARDING.

The Marine Superintendent.
Forwarded for the information of the Council. CAMPBELL HEPWORTH.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

(To 24th April, 1901.)

Weekly Weather Report, 1900.—Proof of Appendix IV and two portions of III received, but printing is being sadly delayed by printer.

Weekly Weather Report, 1901.—All numbers issued to date. Appendix I. (*Quarterly Summary*—January to March) in hand and well advanced. *Monthly Summaries*—January and February issued, March in hand.

Daily Weather Report, 1901.—All numbers issued promptly to date, with charts of Mean Temperature properly changed.

Primary Checking of Storm Warnings, 1901.—Done to date.

Final Checking of Storm Warnings, 1900.—In progress and being pushed forward rapidly—done to end of November.

Checking of 8.30 *p.m. Forecasts*, 1901.—Done to end of March.

Preparation of Ten-day Means—for Germany.—Done to date.

Drawing on Sectional Paper, curves of Mean temperature from the 30-year averages, 1871–1900. Still in progress.

Inquiries by Letter, (1) Jersey Reporter as to sunshine, Oct.–Dec. 1900; (2) Werner & Co. temperature in London and at Barrow-in-Furness, 14–28 April 1899 (M.O. 603).

Circular as to Hay Harvest Forecasts, 1901.—Revised.

Checking of Hay Harvest Forecasts for 1900 completed and report drafted.

Since last report not only have the Easter holidays been taken by the staff, but Mr. Francis has been absent for eight days on sick leave, and Morgan for about three weeks. The final checking of the 1900 storm warnings is being treated as an *urgent* matter, and being pressed forward with all possible speed.

24th April, 1901. FREDC. GASTER.

PANTAGRAPH ROOM.

April 1st, 1901.

Hourly Means.—The volume for 1897 has been published.

For the volume for 1898, in addition to the tables of mean values for Valencia, already sent to the printer, those for Fort William are ready to be sent, whilst those for Aberdeen have been calculated and only require to be copied upon the proper forms; the calculation of the Falmouth values is in a forward state.

Daily Means of Temperature.—Harmonic co-efficients for various stations have been worked, and some curves drawn. A beginning has been made towards extending the mean values from 25 to 30 years.

Inquiry.—From Messas. Mackrell, as to strength of wind in London on January 27th, 1901.

Miscellaneous.—Copies made of sunshine records at Cape Adare.

Bunhill Row sun records tabulated for Royal Meteorological Society, July to December, 1900.

Sunshine returns from Scarborough, Sheffield, and Lowestoft have required special attention.

Pattern cards prepared for use in Antarctic Sunshine Recorder.

R. H. CURTIS.

EXAMINATION BRANCH.

Examinations. 1st April, 1901.

November and December, 1899.—Completed.

January to March, 1900.—Aberdeen and Falmouth Thermograms proceeded with.

January to March, 1901.—Valencia work proceeded with.

Weekly examinations (on receipt) of curves and documents from all Observatories.

Reports, &c.

November and December, 1899.—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.

Sun printing photographic curves.

T. E. ALLEN.

LAND ROOM.

Enquiries during March, 1901. April 4th, 1901.

1. James Bartlett, M.A.—As to differences in the rainfall at various stations in the County of Surrey. (M.O. 401.)

2. Messrs. Bramwell and Bell.—As to the wind and weather at North Shields on certain days in December, 1900. (M.O. 409.)

3. Monsieur Hergesell.—For Ben Nevis Observations on certain days in the months of November and December, 1900, and January, February, and March, 1901. (M.O. 425.)

4. Mr. J. A. Lunniss.—As to the annual rainfall at Hanwell, Middlesex, for the past 20 years. (M.O. 458.)

5. Mr. Bythway.—For the barometric curve for Pontypool for the week, February 21st–28th, 1901. (M.O. 498.)

JOHN A. CURTIS.

In addition to the enquiries referred to above there were 28 personal enquiries during March for forecasts or other weather information and 20 enquiries by telegraph.

24. Submitted—The following Statement of Accounts for the year ending 31st March, 1901 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1899-1900	—	3,702 11 11	Administration :		
Parliamentary vote ...	—	15,300 0 0	Council	917 19 10	
Repayment of expenses charged under—			Secretary	627 11 2	
(1.) Incidental expenses	23 11 1		Salaries and wages ...	912 9 0	
(2.) Observatories ...	25 11 6		Rent, fuel, and lighting	733 16 0	
		49 2 7	Incidental and contingent expenses ...	245 10 7	
			Furniture and fittings	124 15 6	
Superannuation Account	--	35 12 6	Expenses incidental to International Meteorological Congress	26 5 11	
			Pensions*	2,117 12 6	
					5,706 0 6
Special Researches :			Special Researches :		
Grant for investigation on atmospheric electricity	—	80 0 0	Salaries and other charges	703 14 3	
			Investigation on Atmospheric Electricity	100 0 0	
					803 14 3
Supply of Information :			Land Meteorology :		
Daily Weather Charts and Forecasts ...	324 3 1		Observatories and stations, including remuneration of observers	2,254 8 6	
6 p.m. Charts... ...	25 0 0		Salaries :— Discussion and reduction of observations, &c. ...	1,170 19 6	
Reports for Press Agencies, &c. ...	117 6 6				3,425 8 0
Telegrams sent abroad	376 5 0				
		842 14 7	Weather Information and Forecasts :		
Sale of Instruments, &c. :			Telegraphic reports and storm warnings, remuneration of observers, &c.	2,627 14 11	
Royal Navy account	6 13 6		Salaries:—Preparation and issue of reports and forecasts ...	1,892 3 8	
Mercantile Marine account	23 8 0				4,519 18 7
"M.O." (Stations) account	87 5 2				
		117 6 8	Inspections :—		
			Salaries and travelling expenses ...	—	401 10 2
Repayment of Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	215 17 1	Ocean Meteorology :		
			Salaries :— Discussion and reduction of observations... ...	1,320 18 6	
Commission charged on work done for Colonies, &c. ...	—	16 11 9	Expenses incidental to the supply of instruments :—		
			Proportion for care and issue of instruments	125 0 0	
			Royal Navy ...	443 10 4	
			Mercantile Marine	168 14 7	
					2,058 3 5
			Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	322 13 1
			Balance :		
			Cash at Bank... ...	3,071 4 9	
			„ at Office ...	51 4 4	
					3,122 9 1
		£20,359 17 1			£20,359 17 1

Liabilities.	£ s. d.	Assets.	£ s. d.
To Post Office (partly estimated) ...	255 16 2	By cash at Bank	3,071 4 9
„ sundry creditors	326 16 4	„ „ at Office	51 4 4
„ balance	2,856 15 0	„ sundry debtors	316 18 5
	£3,439 7 6		£3,439 7 6

* Includes £1,463 for purchase of annuity on life of Richard Strachan.

25. Submitted—The following statement of accounts: —

	£	s.	d.
Cash balance on 25th March	5,288	5	1
Receipts from 26th March to 23rd April	3,869	11	7
	9,157	16	8
Cheques drawn from 26th March to 23rd April ...	2,534	4	0
Cash balance on 23rd April	£6,623	12	8

26. Submitted—The following list of publications which had been received since the last meeting :—

Allahabad, Meteorological Office.—Annual statement of rainfall in the North-Western Provinces and Oudh for the year 1900.

Batavia, Observatorium.—Regenwaarnemingen in Nederlandsch Indië. 21. Jaarg. 1899.

——— *Royal Magnetical and Meteorological Observatory.*—Observations.

Bognor Climatological Society.—Report. 1898, 1899.

———————————Annual report and results of the observations made during the year 1900, at the Bognor climatological station.

Börnstein, R.—Wetterkunde und Landwirtschaft.

Brussels, Société Royale Belge de Géographie.—Bulletin. 24e année, 1900.

Bucharest, Institutul Meteorologic al Romaniei.—Buletinul lunar al observatiunilor meteorologice din Romania publicat de S. C. Hepites. Anul 9, 1900.

Chemnitz, K. Sächsisches Meteorologisches Institut.—Abhandlungen. Heft 5. Orientirende Untersuchungen über die meteorologisch-hydrographischen Verhältnisse und die Wirkungsweise von Stauanlagen im Gebiete des Weisseritzflusses während der Jahre 1894 bis 1897, von P. Schreiber.

**Cook, F. A.*—Through the first antarctic night, 1898–1899. A narrative of the voyage of the "Belgica" among newly discovered lands and over an unknown sea about the south pole.

Dickson, H. N.—The circulation of the surface waters of the North Atlantic Ocean.

**Fricker, Karl*—The Antarctic regions. Translated by A. Sonnenschein.

Grossmann, L.—Die Aenderung der Temperatur von Tag zu Tag an der deutschen Küste in den Jahren 1890–99.

Halle, Kaiserliche leopoldina-carolinische deutsche Akademie der Naturforscher.—Leopoldina. Heft 34–35, 1898–1899.

Hepites, S. C.—Manifestatiune cu ocasiunea Jumătăteĭ de veac a vîrsteĭ sale 5/17 Februarie 1851—5/18 Februarie 1901.

**Klein, H. J.*—Jahrbuch der Astronomie und Geophysik. 11. Jahrg., 1900.

Lockyer, Sir N., and Lockyer, W. J. S.—On solar changes of temperature and variations in rainfall in the region surrounding the Indian Ocean.

London, General Register Office.—Annual report of the Registrar General of births, deaths, and marriages in England. 62nd, 1899,

London, Meteorological Office.—Instructions for keeping the meteorological log.

London, Royal Geographical Society.—Year-book and record, 1901.

Nottingham, Rural District Council of Basford.—Annual report, 1899–1900. By G. B. Wray Medical Officer of Health.

Pomortzeff, M.—Absolute determination of the elements of terrestrial magnetism. Theory, methods of observation and calculation. Suppl. to Part XXI. of Journ. of Hydrogr.

Rugby School Natural History Society.—Report . . . for the year 1900.

Stonyhurst College Observatory.—Results of meteorological and magnetical observations, 1900.

Toronto, Meteorological Service of the Dominion of Canada.—Cloud observations during 1896 and 1897 at Toronto.

Utrecht, Koninklijk Nederlandsch Meteorologisch Instituut.—Meteorologisch Jaarboek. 1898. 50. Jaarg.

Wild, H.—Ueber eine neue Methode zur Bestimmung der Variationen der Inclination.

York, Yorkshire Philosophical Society.—Annual report . . . for 1900.

* Purchased.

63, *Victoria Street*, *May* 8, 1901.

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.

PROFESSOR DARWIN. | MR. SHAW (*Secretary*).

27. The Minutes of the last meeting (April 24th) were read and confirmed.

28. *Weekly Summary of the Weather for the Fish Trades Gazette* (Minute 5).—The Secretary reported that he had arranged with Mr. Hyde to supply a tabular statement of the weather at 8 a.m. each day at a cost of 1s. per day, and a weekly summary not exceeding 250 words in length on each Friday morning at a cost of 10*s*. 6*d*. per week.

Approved.

29. *Finance* (Minute 6).—The Secretary reported the purchase of £1,576 16*s*. 4*d*. 2½ per cent annuities at 95.

30. *Corporate Seal.*—Resolved—that the Seal of the Council be affixed in the presence of two Directors, in pursuance of a resolution of the Council, and be attested by them.

31. *Sealing of Documents.*—Resolved—(1) That an impression of the seal be appended to a request to the Bank of England to open a Corporate Stock account.

(2) That the seal be affixed to a request to the Chief Accountant of the Bank of England that all dividend warrants due and to become due and payable on the 2½ per cent. annuities standing in the name of the Meteorological Council be forwarded to the Agent of the Bank of England, Western Branch.

32. *Pilot Charts.*—The Secretary reported that he had arranged for the exhibition of the April and May issues of the Pilot Charts at the Royal Society Soirée on May 8th.

Approved.

A revised form of circular 51 relating to the issue of the Charts, adding Plymouth to the list of Mercantile Marine Offices to be supplied, and including a form of return of sea surface temperatures, was approved.

Read—letter 712 from Capt. Raineri, suggesting that the tracks between Gibraltar and New York and the West Indies should be entered in the Charts and asking for a monthly copy.

The Secretary was authorised to send the May issue.

33. *Scilly, Room for Barometers.*—The Secretary reported that he had received a further letter from Lieut.-Col. Kenney, R.E., intimating that the removal of the signal tower was contemplated on account of its position with reference to the new forts, and that he had written (P.C. 1,033) suggesting that he should call on the Commanding Officer at Exeter with reference to the matter in the autumn.

Approved.

34. *Holyhead, Anemometers.*—Reported—Correspondence with Captain Clapp, Harbour Master, respecting the painting of the anemometer stand recently erected by the Board of Trade, from which it appeared that the Board of Trade would arrange for the painting if the Council were prepared to defray the cost.

It was agreed that the offer of the Board of Trade be accepted and Captain Clapp be requested to have the painting carried out at the expense of the Council.

The question of increasing the remuneration of W. Davies, postponed from March 12th (Minutes p. 140), was brought up and discharged.

35. *Oxford.*—Read—Letter 747 from Dr. Rambaut, asking for the loan of a barometer during the repair of the Standard at the Radcliffe Observatory.

Approved.

36. C. E. Goad, messenger, was allowed four days extra leave for a musketry course in preparation for the annual training of the 16th Middlesex Volunteer Regiment, to which he belongs.

37. *Logs.*—Read—A memorandum from the Marine Superintendent stating that since the last meeting three logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

38. Submitted—The following as the result of the primary checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on 3 days, the total number of districts warned being 9.

In 1 district the warnings were justified by a subsequent fresh gale (force 8), and in 3 districts by moderate gales or strong winds (force 7 or 6). In 5 districts they were not required.

GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

Telegraphic Branch,
8th May, 1901.

39. Submitted—The following :—

STORM WARNING CHECKING.

COMPARISON BETWEEN THE WARNINGS AND THE SUBSEQUENT WEATHER IN 1900.

COASTS.	Total No. of Warnings.	Warnings justified by subsequent gales. Force 8 and upwards.	Warnings justified by subsequent strong winds. Forces 6 and 7.	Warnings not justified by subsequent Weather.	Warnings late. Force 9 reached at two stations before issue.	Warnings partially late. Force 9 reached at one station before issue.	Warnings issued in consequence of Telegraphic Errors.	Storms for which no Warning was Issued.
SCOTLAND, N.E. ...	46	33	10	3	—	—	—	March 12.
Do. E.	37	17	19	1	—	—	—	April 15.
Do. N.W. ...	44	27	14	3	—	—	—	Nov. 10.
Do. W.	44	18	19	6	—	1	—	
IRELAND, S.W.	49	32	15	2	—	—	—	June 24.
Do. N.W.... ...	53	38	10	3	—	2	—	June 24, Nov. 8, Nov. 10, Nov. 13–14.
IRISH SEA	43	38	3	1	1	—	—	Aug. 3, Oct. 26.
ST. GEORGE'S CHANNEL	34	23	7	1	—	3	—	
BRISTOL CHANNEL ...	37	30	7	—	—	—	—	
ENGLAND, S.W.... ...	36	26	7	2	—	1	—	Dec. 27.
Do. S.	24	13	7	4	—	—	—	
Do. S.E.	23	15	5	3	—	—	—	
Do. E.	18	11	3	3	—	1	—	Feb. 14, Aug. 3, Oct. 26.
Do. N.E.	24	18	6	—	—	—	—	April 13, April 15, Aug. 3, Oct. 26.
TOTALS	512	339	132	32	1	8	—	
PERCENTAGES ...	—	66·2	25·8	6·3	0·2	1·5	—	

NOTES ON GALES EXPERIENCED IN 1900, FOR WHICH NO WARNING HAD BEEN ISSUED.

January 18*th*—EASTERN SHORES OF IRISH SEA. A N.W. gale.

The Westerly shores of the sea were duly warned, but gale proved more general than was anticipated.

February 14*th*—ENGLAND, E. An E. gale.

Our S. and S.E. coasts were duly warned, but gale extended further than was expected.

March 12*th*—SCOTLAND, E. A N. to N.W. gale.

Due to a secondary depression, not indicated even at 8 a.m. on 12th. In the evening it was too late.

April 13*th*—ENGLAND, N.E. and E. A W. gale.

All our Wrn. coasts had been warned, but gale extended further than was expected, owing to a secondary depression, not indicated beforehand.

April 15*th*—SCOTLAND, E., and ENGLAND, N.E. A S.W. gale.

Similar to next above.

June 24*th*—IRELAND S.W. and N.W. A N.W. gale.

The appearance at 8 a.m. was not threatening, but wind proved stronger than was anticipated.

August 3*rd*—Eastern half of IRISH SEA, ENGLAND, N.E. and E. A N. to N.E. gale.

Many coasts were warned on evening of 2nd., but the disturbance was larger than was anticipated.

October 26*th*—IRISH SEA, ENGLAND, N.E. and E. A N.Wly. gale.

The depression which caused this gale was actually developed over the N. of England on 25th–26th. The gale was accompanied by unusually heavy rains (3 inches and more). The weather was certainly rainy and unsettled, but there was no indication that such a storm was probable.

November 8*th*—IRELAND, N.W. A W. to N.W. gale.

There was no indication of the approach of this gale on the evening of the 7th, and at 8 a.m. on the 8th it was too late to warn.

November 10*th*—SCOTLAND, N.W., and IRELAND, N.W. A W. gale.

Felt at extreme outlying stations only—due to a secondary disturbance of which no indication was given at 6 p.m. 9th.

November 13*th* and 14*th*—SCOTLAND, N.W., and IRELAND, N.W.

This gale was felt at outlying stations only, and was accompanied by a very *sudden increase* of pressure over the Atlantic, in the rear of a previously shallow low-pressure system. I fear it must be long before such an occurrence can be forecast.

December 27*th*—ENGLAND, S.W. A W. gale.

England S. and S.E. were duly warned, but the advent of this depression was very *sudden*, and there were no indications of it prior to its appearance.

F. G.

40. Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of April, 1901 :—

The letters used have the following signification :—

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	37	67	52	87
,,	b	53	17	35	
,,	c	7	10	9	
,,	d	13	6	4	
Scotland, E.	a	57	47	52	85
,,	b	33	33	33	
,,	c	10	10	10	
,,	d	0	10	5	
England, N.E.	a	44	73	59	85
,,	b	33	20	26	
,,	c	20	7	14	
,,	d	3	0	1	
England, E.	a	37	60	49	86
,,	b	37	37	37	
,,	c	26	0	13	
,,	d	0	3	1	
Midland Counties	a	40	63	52	80
,,	b	30	27	28	
,,	c	27	13	19	
,,	d	3	0	1	
England, S.	a	44	60	52	82
,,	b	33	27	30	
,,	c	23	13	18	
,,	d	0	0	0	
Scotland, W.	a	50	70	60	87
,,	b	27	27	27	
,,	c	13	3	8	
,,	d	10	0	5	
England, N.W.	a	43	63	53	77
,,	b	24	23	24	
,,	c	30	7	18	
,,	d	3	7	5	
England, S.W.	a	40	40	40	79
,,	b	40	37	39	
,,	c	13	13	13	
,,	d	7	10	8	
Ireland, N.	a	37	53	45	77
,,	b	37	27	32	
,,	c	16	13	15	
,,	d	10	7	8	
Ireland, S.	a	47	57	52	77
,,	b	23	27	25	
,,	c	20	3	12	
,,	d	10	13	11	
Summary.					
British Islands	a	43	59	51	82
,,	b	34	28	31	
,,	c	19	8	14	
,,	d	4	5	4	

41. Submitted—The following reports of work during the month of April, 1901 :—

MARINE BRANCH.

7th May, 1901.

Examined 14 new logs.

Obtaining monthly results of observations in the region south of the equator, between the West Coast of Africa and longitude 90° W. Drawing wind-roses and preparing coastal wind-charts for South America. Examining proofs of engraved coastal charts, those for January to May, and August passed for Press, and the charts to September are now in the hands of the lithographer.

The North Atlantic and Mediterranean Pilot Chart for May passed for Press; the sheets for June and July completed and sent to the lithographer; and the preparation of the one for August well advanced.

Preparation and extraction of meteorological data in high southern latitudes for the use of the coming Antarctic Expedition, and making a copy of the results.

Sunrise and sunset tables for various stations prepared for use in the Daily Weather Reports.

Meteorological results for Bay of Bengal stations prepared for insertion in the new issue of the Admiralty Sailing Directions.

Assistance given to the Telegraph Branch in distributing Daily Weather Reports to the railway bookstalls.

CHAS. HARDING.

Forwarded for the information of the Council.

CAMPBELL HEPWORTH,
The Marine Superintendent.

EXAMINATION BRANCH.

1st May, 1901.

Examinations.

January to March, 1900.—Aberdeen and Falmouth thermograms completed.

April to December, 1900.—Aberdeen thermograms proceeded with.

January to March, 1901.—Valencia work completed.

Weekly examinations (on receipt) of curves and documents from all observatories.

Reports, &c.

January to March, 1900.—Copies of thermograph "Notes of Errors" to Aberdeen and Falmouth.

January to March, 1901.—Copies of "Notes of Errors" to Valencia.

Examining and copying hourly values of the barograph, thermograph, anemograph, vapour tension and rain for 14th—16th April, 1901 at Valencia.

Sun printing photographic curves and tracing and printing anemograph and rain curves.

T. E. ALLEN.

PANTAGRAPH ROOM.

1st May, 1901.

Hourly Means.—Although an instalment of "Copy" for the volume for 1898 has now been with the printer for more than two months, not a sheet of proof has yet been received from him. The preparation of the various tables for the volume is now about three-fourths finished.

Daily Means of Temperature.—The extension of these mean values from 25 to 30 years, bringing them up to the close of 1900, has been completed, so far as tabulations are available. I am now awaiting more tabulations from Mr. Allen. Harmonic coefficients have been worked, and other work done in connexion with the discussion of the observations.

Inquiry.—I attended the Admiralty Court on subpoena, for Messrs. Cooper, one day.

Miscellaneous.—With Dr. Chree, on testing of sunshine recorders. With Mr. Bernacchi, on Cape Adare observations, &c. On a special sunshine bowl for Antarctic Expedition. Enquiry into strong gales of last year, for Annual Report. Sunshine cards for 1900 have been packed and stored.

R. H. CURTIS.

LAND ROOM.

May 7th, 1901.

Enquiries during April, 1901.

1. Messrs. Bramwell and Bell.—As to the wind and weather at North Shields on March 27th and March 28th, 1901. (M.O. 524.)

2. Messrs. Gilbert Gilkes & Co.—As to the average rainfall at certain places in Co. Cavan. (M.O. 678.)

3. Messrs. Cannon, Sons and Morton.—As to very high winds experienced at Chislehurst since December 12th, 1900. (M.O. 665.)

4. Dr. G. A. Crace-Calvert.—As to the average rainfall in the Vale of Clwydd, North Wales. (M.O. 701.)

JOHN A. CURTIS.

In addition to the enquiries referred to above, there were 28 personal enquiries during April for forecasts or other weather information, and 16 enquiries by telegraph.

41—*continued.*

MONTHLY RETURN OF "A." INSTRUMENTS ON CHARGE.

30th April, 1901.

——	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Terr. Radiation.						
Dr.													
On Charge, 1st April ...	51	100	73	70	65	—	—	44	45	2	—	—	
Received since ...	28	16	107	6	3	—	—	1	—	—	—	—	
	79	116	180	76	68	—	—	45	45	2	—	—	
Cr.													
Sent out during month	19	33	50	9	6	—	—	—	—	—	—	—	
On Charge, 1st May ...	60	83	130	67	62	—	—	45	45	2	—	—	

9th May, 1901. R. F. WALLACE.

MONTHLY RETURN OF "M.O." INSTRUMENTS ON CHARGE.

April, 1901.

——	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Terr Radiation.						
Dr.													
On Charge, 1st April ...	32	6	98	7	5	6	3	25	88	6	2	10	3 Sunshine Frames and 4 Spheres.
Received since ...	17	—	18	—	—	—	—	3	11	2	2	—	1 Thermograph.
	49	6	116	7	5	6	3	28	99	8	4	10	
Cr.													
Sent out during month	10	—	8	3	1	4	1	1	1	1	2	—	2 Sunshine Recorders and Spheres. 1 Thermograph.
On Charge	39	6	108	4	4	2	2	27	98	7	2	10	1 Sunshine Recorder, 2 Spheres.

9th May, 1901. R. F. WALLACE.

42. Submitted—The following Statement of Accounts :—

	£	s.	d.
Cash balance on 23rd April	6,623	12	8
Receipts from 24th April to 7th May	33	5	2
	6,656	17	10
Cheques drawn from 24th April to 7th May ...	976	9	6
Cash balance on 7th May	£5,680	8	4

43. Submitted—The following list of publications, which had been received since the last meeting :—

Bath, Medical Officer of Health.—Annual report to the Bath Urban Sanitary Authority. By the Medical Officer of Health. 35th, 1900.

Bathurst, Gambia.—Comparative rainfall, Colony of the Gambia, 1896–1900, and meteorological observations, 1900.

Budapest, K. Ung. Reichsanstalt für Meteorologie u. Erdmagnetismus.—Bericht über die Thätigkeit der Kgl. Ung. Reichsanstalt für Meteorologie u. Erdmagnetismus und des Central-Observatoriums in O-Gyalla im Jahre 1900.

Christiania, Norwegisches Meteorologisches Institut.—Jahrbuch . . . für 1900. Herausgegeben von H. Mohn.

Collenette, A.—Guernsey weather compared with English weather, from the agricultural point of view, for the year 1899.

Copenhagen, Dansk Meteorologisk Institut.—Nautisk-meteorologisk Aarbog. 1900.

Frankfurt am Main, Physikalischer Verein.—Das Klima von Frankfurt am Main. Eine Zusammenstellung der wichtigsten meteorologischen Verhältnisse von Frankfurt a. M. nach vieljährigen Beobachtungen im Auftrag des Physikalischen Vereins bearbeitet von J. Ziegler und W. König. Nachtrag.

Hamburg, Deutsche Seewarte.—Resultate meteorologischer Beobachtungen von Deutschen und Holländischen Schiffen für Eingradfelder des nord-atlantischen Ozeans. Quadrate 80, No. 19.

Hastings.—Annual report of meteorological observations for the year 1900. H. Colborne, Borough Meteorologist.

Kazan, Observatoire Magnétique de l'Université Impériale.—Observations . . . . publiées par W. Uljanin. 1894–1897.

Markham, C. A.—Meteorological reports and observations for Northamptonshire. 1889–1900.

Naples, R. Osservatorio di Capodimonte.—Osservazioni meteoriche. 1899, 1900. 2 vols.

———————————————Riassunti decadici e mensuali delle osservazioni meteoriche fatte nel R. Osservatorio di Capodimonte del V. Alberti. 1899.

———————————————Valori medj decadici e mensili e riassunto annuale delle osservazioni meteoriche fatte nel R. Osservatorio di Capodimonte del V. Alberti. 1900.

Newquay, Urban District Council.—Annual report on the health and sanitary condition of the Town and Urban District of Newquay for 1900. By A. Hardwick.

Tyrer, R.—Annual report upon the meteorology of Cheltenham, being an abstract of meteorological observations taken at the Observatory, Prestbury Road, Cheltenham, during the year 1900.

Upsala, Observatoire Météorologique de l'Université.—Bulletin mensuel. Par H. H. Hildebrandsson. Vol. 32. 1900.

Utrecht, Koninklijk Nederlandsch Meteorologisch Instituut.—Onweders, optische verschijnselen, enz., in Nederland. 1900. Deel 21.

Washington, United States Naval Observatory.—Astronomical, magnetic and meteorological observations. 1891, 1892. 2 vols.

Weber, L.—Mittheilung über einen die Mistpoeffers betreffenden Versuch.

————————Die Temperaturschwankungen in Kiel.

————————Versuch einer Temperaturprognose für den kommenden Monat.

63, *Victoria Street, May* 22, 1901.

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	THE HYDROGRAPER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

44. The Minutes of the last meeting (May 8th) were read and confirmed.

45. Submitted—The following correspondence :—

I.—*From the Chairman to Mr. Galton.*

DEAR MR. GALTON, May 9th, 1901.

THE new body of Directors of the Office held their first meeting on Wednesday, the 24th April. In the letter from the Royal Society notifying their appointment, there was a paragraph intimating that the resignation of your seat on the Council had been accepted.

It was only natural that the first act of the new body should be to recall the long period during which you have occupied a seat either on the original Meteorological Committee, or the Council, and to endorse, with the emphasis arising from their fuller knowledge of your work, the appreciation which the President and Council of the Royal Society recorded in their letter.

It therefore becomes a duty, by which I am no little honoured, to convey to you the feeling of the Council upon the termination of your official services as a member of the body on which we have so long worked together. This task I undertake with a full sense of the difficulty of adequately expressing the extent to which the work of the Meteorological Office is indebted for its success and utility to your services, which have extended over 34 years.

It is no exaggeration to say that almost every room in the Office and all its records give unmistakable evidence of the active share you have always taken in the direction of the operations of the Office. The Council feel that the same high order of intelligence and inventive faculty has characterized your scientific work in Meteorology that has been so conspicuous in many other directions, and has long become known and appreciated in all centres of intellectual activity.

With the Office entering upon a new phase of its service to the public, it is impossible for the Council not to feel that the work of the past 34 years has only opened the way, as all good work does, for further developments. I am confident that you will still be interested in the success of the undertaking in which you have had so great a share, and the Council will value in the future, as they have done in the past, any suggestion you may make about the work of the Office.

Believe me,
Very faithfully yours,
R. STRACHEY,
Chairman.

F. Galton, Esq., F.R.S.,
42, Rutland Gate,
Hyde Park, S.W.

II.—*From Mr. Galton (in reply).*

42, Rutland Gate, S.W.,
May 17, 1901.

DEAR SIR RICHARD STRACHEY,

YOUR gracious letter, written on behalf of the Meteorological Council, has touched me greatly.

It is almost needless to say that I hope to follow with undiminished interest, though at a distance, the future efforts of the Council to advance meteorological science.

I shall always proudly cherish the recollections of my cordial association, during 34 years, with colleagues eminent in science, and not least with yourself.

Believe me,
Very faithfully yours,
FRANCIS GALTON.

To General Sir Richard Strachey, G.C.S.I.,
Chairman of the Meteorological Council.

III.—*From the Royal Society.*

M.O. 488.

Burlington House, London, W.,
May 15, 1901.

DEAR MR. SHAW,

WITH reference to your letter (488) of the 30th ult., the Earl of Rosse, Mr. Buchanan, Dr. Scott, and Professor Schuster have been informed of their appointment as members of the Meteorological Council, and as soon as they notify acceptance I will let you know. Mr. Dines has written accepting the post.

I am, &c.,
ROBERT HARRISON,
Asst. Sec. R.S.

W. N. Shaw, Esq., F.R.S.,
Secretary, Meteorological Office.

46. *Scottish National Antarctic Expedition.*—Read—The following letter from Mr. W. S. Bruce, leader of the expedition :—

M.O. 791.

Royal Scottish Geographical Society,
Queen Street, Edinburgh
Address till Tuesday—
23, Edith Grove, West Brompton, S.W.,
May 16th, 1901.

DEAR SIR,

IN reference to my visit this morning regarding the Scottish National Antarctic Expedition, may I ask if the Meteorological Office will consider helping this expedition in meteorological outfit.

I enclose herewith the general plan of the work proposed, in which it will be seen that the expedition intends to penetrate the Antarctic regions in the Weddell Sea, along the meridian of 30° W., and there to set up a wintering station on land in as high a southern latitude as possible. The instruments required, therefore, are such as would serve for the proper equipment of a fixed station, as well as those necessary for observation on board ship, and during sledge journeys.

Should the Meteorological Council do me the honour to consider the proposal, I shall be prepared to draw up a list of instruments such as I should consider necessary for further consideration by the Council.

It is hoped that the expedition will start during the coming autumn, though owing to the very extensive preparation necessary, and the little time between then and now, it may be found necessary to postpone departure until next year.

I remain, &c.,
WM. S. BRUCE.

To the Secretary of
The Meteorological Council.

The Secretary was instructed to reply that the Council would consider any specific proposal when Mr. Bruce was in a position to state definitely that the expedition would be sent out.

47. *Antarctic Expedition.*—(1) In pursuance of Minute 9 the Secretary submitted a proof of a circular to be sent to observers and to steamship companies whose steamers go south of latitude 30° S., asking for daily observations at noon (G.M.T.) between October 1st, 1901, and March 31st, 1903. He also reported that he was having copies of a meteorological register printed for issue to observers in the form drawn up by the German Committee and approved by the English Committee.

Approved.

(2) Submitted—A proof of the form of meteorological register and observation book drawn up by the Hydrographer to be supplied for the use of the National Expedition.

Approved.

(3) The Secretary reported that the transcript of office data asked for by Sir C. Markham (Minute 3 of January 30) had been completed at a cost of £76 9*s.*, of which £15 2*s.* 9*d.* represented the cost of making a second copy to be retained for the use of the Office ; and that he proposed to forward the transcript to the Committee of the National Antarctic Expedition and charge £25 for it.

Approved.

(4) The Secretary reported that the summary of observations contained in the meteorological log of the "Southern Cross" and the tabulation of the observations at Cape Adare undertaken for the Royal Society (Minute 2 of March 12) had been completed, and that he had arranged for the copy to be forwarded at once to the Royal Society to be set up in type in order that a copy might be sent to the National Antarctic Expedition without delay, and another to Mr. Bernacchi for the preparation of his paper on the relation of temperature and winds. He further reported that an attempted examination of the diurnal variation of pressure from the barometric readings with the assistance of the barograph curves had not been very satisfactory, and that he proposed to make a further attempt with the semi-diurnal variation.

Approved.

48. *Re-publication of Official No.* 59.—Submitted—Proofs of a reproduction in accordance with Minute 12.

The size was approved, but the Secretary was instructed to obtain more satisfactory impressions.

49. *Pilot Charts.*—It was agreed that a free copy of the Pilot Charts be sent to Mr. E. Douglas Archibald.

50. *Admiralty Instruments.*—Read—The following letter :—

M.O. 814.

Hydrographic Department,
May 20th, 1901.

INCREASE OF ESTABLISHMENTS OF METEOROLOGICAL INSTRUMENTS AT THE NAVAL DEPÔTS AT THE CAPE OF GOOD HOPE AND IN CHINA.

SIR,

IN consequence of the increase of the Squadrons on the Cape of Good Hope and China Stations, it has been found necessary to increase the stock of meteorological instruments at the Naval Depôts of Simon's Bay and Hong Kong.

It is requested that the undermentioned quantities of instruments may be substituted for those at present in force, and that in future these revised stocks may be maintained.

I have, &c.,
W. J. L. WHARTON,
Hydrographer.

The Secretary,
Meteorological Office,
65, Victoria Street, S.W.

Name of Depôt.	Barometers.		Thermmoeters.				Hydrometers.
	Mercurial.	Aneroid.	Ordinary.	Maximum.	Minimum.	Screens.	
Cape of Good Hope	7	8	33	8	8	2	6
Hong Kong ...	17	21	87	21	21	5	10

It was resolved that the establishments be raised to the figures named in the letter.

51. *Falmouth* (Minute 15).—The Secretary reported that he had learned in the course of an interview with Mr. Kitto that the Observatory authorities would probably be willing to defray the cost of erecting a Dines' pressure tube anemograph if the Council supplied the instrument and all accessories and materials ready for erection.

The Secretary was directed to report further upon the suitability of the site after visiting the Observatory in the summer.

52. *Second-hand Instruments.*—An offer (M.O. 785) by Mr. K. I. Marks of second-hand thermographs and a hygrograph for sale was declined, and the Secretary was authorised to obtain a Richard hygrograph for the Office.

53. *Harvest Forecasts.*—The Secretary reported that he had re-issued the circular 46A in revised form in the same manner as last year (Minute 12 of June, 1900), and suggested June 1 as a suitable date for commencing the harvest service of forecasts.

Approved.

54. *Daily Weather Report.*—It was agreed to replace the maps of mean maxima and mean minima by maps of extreme maxima and minima combined from July 1.

55. *Liverpool Journal of Commerce.*—The Secretary exhibited a map issued by the Liverpool Journal of Commerce prepared from telegrams obtained through the Office, and was directed to point out that an acknowledgment of the source from which the information is obtained should appear on the map.

56. *Haverfordwest* (M.O. 781).—The Secretary was authorised to accept sunshine records from Haverfordwest and other volunteer observers, and to enlarge the monthly report by a page if necessary.

57. *Logs.*—Read—A memorandum from the Marine Superintendent stating that since the last meeting six logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

58. *Storm Warnings.*—Reported :—

Since the last meeting of the Council no warnings had been issued, nor had any gales been experienced on the coasts of the British Islands.

FREDC. GASTER.

Telegraphic Branch,
22nd May 1901.

59. *Payment of Female Clerks.*—The Secretary reported a request from the female clerks that they might be paid monthly instead of weekly.

Allowed.

60. Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 7th May	5,680	8	4
Receipts from 8th to 21st May	58	9	7
	5,738	17	11
Cheques drawn from 8th to 21st May	1,724	15	10
Cash balance on 21st May	£4,014	2	1

61. Submitted—The following list of publications, which had been received since the last meeting :—

Bangalore, Mysore Government Meteorological Department.—Mysore meteorological memoirs, No. 1. Containing, for the period of the four years 1895–1898, the hourly records obtained with the autographic instruments at the Bangalore Observatory. Containing also a descriptive sketch of the Observatory and the instruments.

Barbados, Botanic Station.—Occasional bulletin of miscellaneous information, No. 10. West Indian hurricanes, with some observations on the hurricane of the 10th September, 1898, at Barbados. [By E. L. Skeete.]

Bruce, W. S.—The proposed Scottish National Antarctic Expedition. Second and revised reprint.

Calcutta, Meteorological Office, India.—Rainfall of India. 9th year. 1899.

Dover, John.—Report of meteorological observations for the year 1900, with extremes and averages for preceding years, at Totland Bay, Isle of Wight.

Greenwich, Royal Observatory.—Results of the magnetical and meteorological observations made at the Royal Observatory, Greenwich, in the year 1898 ; under the direction of W. H. M. Christie.

Manila, Observatorio.—El baguio del 8 de Septiembre 1900 por el P. José Coronas.

Rambaut, A. A.—Underground temperature at Oxford in the year 1899, as determined by five platinum-resistance thermometers.

São Paulo, Commissão Geographica e Geologica. Secção Meteorologica.—Dados climatologicos. 1898, 1899. 2 vols.

Southport, Fernley Observatory.—Report and results of observations for the year 1900. By J. Baxendell.

Toronto, Meteorological Office.—Storm signals employed by the Canadian Meteorological Service.

63, *Victoria Street, June 4th*, 1901.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

THE HYDROGRAPHER. | MR. SHAW (*Secretary*).

62. The Minutes of the last meeting (May 22nd) were read and confirmed.

63. *General Meeting.*—It was agreed that a General Meeting of the Council be held on July 3rd and that proof copies of the Annual Report be circulated to all the Members of the Council before the meeting.

64. *Royal Crown and Cypher.*—The Secretary reported the receipt of a letter (M.O. 889) from the War Office, enclosing photographic reproductions of drawings of the "Tudor" Crown and the Royal and Imperial Cyphers approved by H.M. the King.

65. *Pilot Charts.*—Read letter (M.O. 934) from the Senior Surveyor, Board of Trade, Barry, asking for a copy of the Pilot Charts to be supplied to that Office for exhibition.

Allowed.

66. Read—A memorandum from the Marine Superintendent stating that since the last meeting eight logs had been received, one of them being excellent.

The Secretary was directed to returned the best thanks of the Council to the observers.

67. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on 2 days, the total number of districts warned being 6.
In 3 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 3 districts by moderate gales (force 7).

GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDK. J. BRODIE,
pro
FREDC. GASTER.

Telegraphic Branch,
4th June, 1901.

68. Submitted—The following report on the forecasts issued at 8.30 p.m daily during the month of May, 1901 :—

The letters used have the following signification :—

a = complete success
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	71	71	71	93
"	b	23	20	22	
"	c	6	6	6	
"	d	0	3	1	
Scotland, E.	a	61	55	58	89
"	b	26	35	31	
"	c	7	10	8	
"	d	6	0	3	
England, N.E.	a	68	52	60	83
"	b	13	32	23	
"	c	16	16	16	
"	d	3	0	1	
England, E.	a	68	61	65	87
"	b	19	26	22	
"	c	10	13	12	
"	d	3	0	1	
Midland Counties	a	61	71	66	86
"	b	20	19	20	
"	c	16	10	13	
"	d	3	0	1	
England, S.	a	55	65	60	83
"	b	23	22	23	
"	c	22	13	17	
"	d	0	0	0	
Scotland, W.	a	68	77	73	87
"	b	16	13	14	
"	c	6	10	8	
"	d	10	0	5	
England, N.W.	a	71	81	76	88
"	b	13	10	12	
"	c	10	9	9	
"	d	6	0	3	
England, S.W.	a	65	68	67	87
"	b	19	22	20	
"	c	10	10	10	
"	d	6	0	3	
Ireland, N.	a	74	81	78	96
"	b	26	10	18	
"	c	0	6	3	
"	d	0	3	1	
Ireland, S.	a	81	74	78	91
"	b	16	10	13	
"	c	3	13	8	
"	d	0	3	1	
Summary.					
British Islands	a	68	69	69	88
"	b	19	20	19	
"	c	10	10	10	
"	d	3	1	2	

69. Submitted—The following reports of work during the month of May, 1901 :—

MARINE BRANCH.

June 3, 1901.

Examined 15 new logs and one lighthouse register.

Obtaining results of observations in the district south of the Equator, from the west coast of Africa westward to long. 90° W. Drawing wind-roses, and preparing coastal and ocean charts. The October coastal chart sent to the lithographer, and June and July for revise.

The North Atlantic and Mediterranean Pilot Chart for June passed for press; July in the hands of the lithographer; the drawing of the August chart completed, and the preparation of September information well advanced.

Ocean meteorological data south of 50° S. obtained from logs in the Meteorological Office for Squares 493 to 503, contained in 58 data books, completed and forwarded to the National Antarctic Expedition Committee. The information copied for preservation in the Office.

Discussion of observations contained in the log of the steam yacht "Southern Cross" from December, 1898, to March, 1900, completed and forwarded to the Royal Society.

Drawing up Forms for synchronous observations on vessels traversing the Southern Oceans during the period of the Antarctic Expeditions, and circulars to shipowners requesting their co-operation in obtaining information from captains.

Correspondence relative to the keeping of Ice Reports for the Pilot Charts, and the special observations in the Southern Hemisphere to be made in connexion with the English and German Antarctic Expeditions.

Assistance given to the Telegraph Branch in distributing Daily Weather Reports to the railway bookstalls.

CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

CAMPBELL HEPWORTH.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

Daily Weather Report.—Charts of Mean values for p. 2 prepared and issued. Correction and addition sheet for April issued. Mean values for July–December (published monthly in the form of a supplement) gone to printer.

Weekly Weather Report.—Appendices III. and IV. for 1900 issued. Title page and preface for 1900 in printer's hands. *Monthly Summaries*—March returned for press; copies should have been in before this. April now being prepared.

Primary Checking of Storm Warnings, 1901.—Done to date.

Final Checking of Storm Warnings, 1900.—Completed and results handed in.

Checking of 8.30 *p.m. Forecasts.*—Results for April and May handed in.

Preparation of Ten-day Means—for Germany.—Done to date.

New Means for the period ending 1900.—These are now well advanced. Means of the following elements are completed for all the daily and weekly weather report stations :—Mean Temperature and mean maximum and minimum temperature for the 30 years 1871 to 1900.

Annual Report for year ending March 31*st*, 1900.—Appendices revised and a statement prepared showing the more striking features in the weather of 1900.

Harvest Forecasts, 1901.—The preliminary arrangements for the issue of these have now been made.

Inquiry by Letter—From Messrs. Foster and Dicksee as to the daily amount of rain in London from February 16th to May 2nd, 1901.

FREDC. J. BRODIE,
pro
FREDC. GASTER.

4th June, 1901.

PANTAGRAPH ROOM.

June 1st, 1901.

Hourly Means.——Vol. for 1898. Proof sheets have been read and passed for press up to page 30, the printer has "copy" for the next fifty pages. The tables of Falmouth results are being copied for press, and those for Kew, the final Observatory, are in an advanced state.

Daily Means of Temperature.—The extension of these Mean values to include the lustrum ending with 1900 has been completed for three of the four Observatories; the remaining tabulations have now been received and the work will be completed during the current month.

Miscellaneous.—Testing Sunshine Recorder received from Blackpool. Work on Antarctic Sunshine Recorder, and preparing special cards. Harmonic Coefficients of temperature, and drawing curves; Kew, &c. Preparing new anemogram form. Making diagram of Aitken's Dust Counter. Preparing list of strong gales experienced in 1900, for the Annual Report.

R. H. CURTIS.

EXAMINATION BRANCH.

1st June, 1901.

Examinations.

January, 1900.—Proceeded with.

April to December, 1900.—Aberdeen and Falmouth thermograms completed.

Weekly examinations (on receipt) of curves and documents from all Observatories.

Reports, &c.

April to December, 1900.—Copies of Thermograph "Notes of Errors" to Aberdeen and Falmouth.

Sun printing photographic curves.

T. E. ALLEN.

LAND ROOM.

June 3rd, 1901.

Enquiries during May, 1901.

1. Mr. F. Weatherley.—As to the weather between Dublin and Holyhead on October 3rd, 1899. (M.O. 731.)

2. Massey's Brewery Co., Ltd., Burnley.—As to the minimum temperature in Lancashire during the period April 21st–30th, 1901. (M.O. 762.)

3. Mr. H. P. Meares, Penrhyn Quarry.—As to the rainfall in North Wales during the last 10 years. (M.O. 835.)

JOHN A. CURTIS.

In addition to the enquiries referred to above there were 28 personal enquiries during May for forecasts or other weather information and 16 enquiries by telegraph.

MONTHLY RETURN OF "A" INSTRUMENTS ON CHARGE.

31*st May*, 1901.

—	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Terr. Radiation.						
Dr.													
On charge, 1st May ...	60	83	130	67	62	—	—	45	45	2	—	—	
Received since ...	5	9	8	—	4	—	—	—	—	—	—	—	
	65	92	138	67	66	—	—	45	45	2	—	—	
Cr.													
Sent out during month	16	22	57	5	5	—	—	2	—	—	—	—	
On charge, 1st June ...	49	70	81	62	61	—	—	43	45	2	—	—	

5th June, 1901.

R. F. WALLACE.

MONTHLY RETURN OF M.O. INSTRUMENTS ON CHARGE.

31*st May*, 1901.

—	Barometers.	Aneroids.	Thermometers. Ordinary.	Maximum.	Minimum.	Solar Radiation.	Terr. Radiation.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
Dr.													
On charge, 1st May ...	39	6	108	4	4	2	2	27	98	7	2	10	1 Sunshine Recorder. 2 Spheres.
Received since ...	5	—	50	15	24	4	8	—	7	2	—	—	1 Self-registering Rain Gauge. Part of the Instruments for Ant. Ex., 1901.
	44	6	158	19	28	6	10	27	105	9	2	10	
Cr.													
Sent out during month	22	3	75	4	12	4	2	3	6	2	—	2	1 Sunshine Recorder and Sphere. 1 Self-registering Rain gauge. Part of the Instruments for Ant. Ex., 1901.
On charge, 1st June ...	22	3	83	15	16	2	8	24	99	7	2	8	1 Sphere.

5th June, 1901.

R. F. WALLACE.

70. Submitted the following memoranda :—

June 4, 1901.

(1.) Sea surface temperatures in the North Atlantic, north of 40° N. lat. and from 10° to 50° W. long. for the months October to March inclusive, in the several years from 1878 to 1891 were some years ago plotted on separate charts in this Office. As some of the staff of the Marine Branch will in the near future be available for the discussion of new work, permission is asked to follow up the above, bringing it up to date, arranging and amplifying it with a view to comparing departures from normal with subsequent climatic conditions over North Western Europe.

(2.) There being available a large amount of information, most valuable to seamen, relating to the meteorology of the Indian Ocean—published principally by the Meteorological Council, or the Indian Government—which is out of the reach of most navigators, the advisableness of issuing from this Office a monthly Pilot Chart of the said Ocean is here suggested. It is believed that the Mercantile Marine of this country would welcome the undertaking and greatly benefit by it.

CAMPBELL HEPWORTH,
Marine Superintendent.

71. Submitted—The following statement of accounts :—

	£	*s.*	*d.*
Cash balance on 21st May	4,014	2	1
Receipts from 22nd May to 4th June	22	1	7
	4,036	3	8
Cheques drawn from 22nd May to 4th June ...	715	7	7
Cash balance on 4th June	£3,320	16	1

72. Submitted—The following list of publications which had been received since the last meeting :—

Coventry, Medical Officer of Health.—Annual report on the health of the City, by E. H. Snell, 1900.

Havana, Observatorio del Colegio de Belen de la Compañia de Jesus.—Observaciones magnéticas y meteorológicas. 1876, 1900.

Hellmann, G.—Neudrucke von Schriften und Karten über Meteorologie und Erdmagnetismus. Herausgegeben von G. Hellmann. No. 13. Meteorologische Beobachtungen vom xiv. bis xvii. Jahrhundert.

Kettle, W. R.—A supplement to the fifth edition of Findlay's sailing directory for the South Pacific Ocean, including revised descriptions of the coasts, islands, etc.

Mauritius, Royal Alfred Observatory.—Annual report . . . for the year 1899.

Tiflis, Physikalisches Observatorium.—Beobachtungen. 1897.

Toronto, Magnetical Observatory.—General meteorological register for the year 1900.

63, *Victoria Street, June* 19, 1901.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	THE HYDROGRAPHER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

73. The Minutes of the last meeting (June 4th) were read and confirmed.

74. *Royal Geographical Society* (Minute 10).—Read—The following letter :—

M.O. 932.

1, Savile Row,
Burlington Gardens, W.,
5th, June, 1901.

SIR,

I HAVE to acknowledge receipt of your letter of May 23rd (M.O. 605), with copy of the observations on the Victoria Nyanza and the Upper Nile.

As a copy was also forwarded to Mr. E. G. Ravenstein, I consulted him as to what would be the best course to follow with respect to the publication of the observations. He informs me that the observations will be reduced by him and published in the next report of the British Association, and that he will furnish me with an abstract for publication in the "Geographical Journal," including other observations which will fill up gaps in those forwarded by you. The complete observations will of course always be available here for reference.

Trusting that this course may recommend itself to the Meteorological Office.

I am, &c.,

J. SCOTT KETTIE,
Secretary, R.G.S.

The Secretary,
Meteorological Office.

It was agreed to accept the suggestion contained in the letter.

75. *Ben Nevis Observatories.*—Read—The following letters (M.O. 988) :—

M.O. 988.

Scottish Meteorological Society,
122, George Street, Edinburgh,
17th June, 1901.

SIR,

IN your letter of 7th March last you say :—"In reply to your letter of the 21st ultimo I am directed by the Meteorological Council to say, that in arranging for the disposition of the funds at their disposal, the Council have already had regard to the fact that it was proposed to discontinue the Ben Nevis Observatories in December, 1901, and they cannot reconsider their arrangements until the accounts are complete after the close of the financial year ending March 31st, 1901." We have now reached the 17th June and the Directors of the Ben Nevis Observatories would be glad to know whether the arrangements of the Council have been reconsidered, and whether the grant of £250 to the Low Level Observatory is to be continued. The Directors assume that the grant of £100 to the High Level Observatory will not cease so long as that Observatory is in operation. The Directors desire to have the information now asked in order to enable them to give satisfactory answers to two gentlemen who have each offered a further donation of £500.

With reference to the two concluding paragraphs of your letter of 7th March I beg to say that the work done at the two Observatories has been exactly the same during all the years of their existence. A copy of all the observations made at the High Level Station up to 31st May of this year has been transmitted to your Council, and also a copy of all observations made at the Low Level Station up to 30th June, 1900. The causes of this difference are known to you. I enclose for your information the two last reports on the work of the Observatories, which were made to the British Association for the Advancement of Science, and also a copy of those parts of the two last reports to the Scottish Meteorological Society which bear on the subject. As you are probably aware, the whole of the observations made simultaneously at the High and Low Level Observatories over a period of 11 years—that is, a sun spot period—are now being put into type. More than half of the first volume is already printed off. The cost will be about £1,000 and the Royal Societies of London and Edinburgh have undertaken to meet this charge. The whole work of the period of 11 years, which will be completed at the end of this year, is at the same time being studied in various directions by Dr. Buchan and Mr. Omond, with the aid of skilled assistants whom the Directors have been enabled to employ. It is intended to print the results of this research with the observations, and the Directors hope that they will disclose a practical utility of the work in its influence on weather forecasting, and a scientific utility in the general study of the phenomena of weather.

It is, perhaps, desirable to say that some of the results of the study to which I have referred will be given in the first volume which, as stated, is already in an advanced state of preparation. In like manner, some of the results of this study will be given in the succeeding volumes. A final contribution, dealing with the whole period, will appear in the last volume.

I am, &c.,

ARTHUR MITCHELL.

W. N. Shaw, Esq.,
Meteorological Office.

EXTRACT FROM REPORTS TO THE GENERAL MEETING OF THE SCOTTISH METEOROLOGICAL SOCIETY.

31st July, 1899.

The health of the observers at the Ben Nevis Observatories has continued good ; and the laborious work of making the hourly observations, by night as well as by day, has been carried on uninterruptedly as heretofore. The Directors again record special thanks to Mr. John S. Begg for a month's volunteer services at the High Level Observatory in June last, thus affording a month's much needed relief to one of the staff.

Arrangements are being again made for the resumption of the observations at the Intermediate Station on Ben Nevis, at a height of 2,200 feet, during the coming holiday season.

Observations have been received from Dr. Paterson, Medical Missionary, the Society's corresponding member at Hebron in Palestine. These observations are from February, 1896, to March, 1899, and a discussion of these valuable records will appear in the forthcoming *Journal*.

Arrangements have been made for the publication, during the next three years, in the *Transactions* of the Royal Society of Edinburgh of the observations made at the two Observatories from 1888 to 1901, the time to which it has been proposed to continue the observations. These observations will fill three large quarto volumes, the cost of publishing which will be a little over £1,000. The Royal Society of London have agreed to give £500, being half of the whole expenditure, the balance being met by the Royal Society of Edinburgh.

Meanwhile the printing is being proceeded with, and a few of the early sheets are submitted to the meeting.

No time is lost in pressing forward the preparation for publication of the next issue of the Society's *Journal*, for the two years 1897–98. It will be in the hands of Members some time before Christmas.

Much time continues to be given to the discussion of the hourly observations of the two Observatories. The work of reducing and entering the observations of the two Observatories for every day, side by side, so as to present a direct and easy comparison of the two, is far advanced, being carried down to the close of 1897. The number of daily sheets thus finished is 2,710, and as each sheet contains twenty-two columns, the laboriousness of the work will be in some degree understood.

As explained in previous Reports, the rainfall, fog, thunder, lightning, halos, aurora, and other phenomena observed at 120 places on each day are entered on a map of Scotland for that day. The whole of these maps are now completed down to December, 1898, the number of these maps amount

to 2,922. A beginning has been made to enter on the 2,922 maps the gales and storms that have been noted at the lighthouses round the Scottish coast, care being taken to mark the hour of commencement of each storm, so that a comparison may be made with the outburst of the storms and the forecasts issued by the Meteorological Office in London.

Based on the observations of the two Observatories thus presented and charted, various inquiries are afoot by the Secretary and Mr. Omond, both of a scientific and practical character.

19th March, 1900.

The observations at the Intermediate Station on Ben Nevis were undertaken by Mr. D. W. Wilton. These important observations, made in the summers of 1897, 1898, and 1899, are being discussed under the superintendence of Mr. Omond.

The next number of the Society's *Journal* is nearly all in type, and will be distributed to Members early in April. Thereafter, the publication of the second half of Vol. VI. of the *Journal* will be pushed forward, and it is expected that the part will be ready for distribution in the autumn. A good deal has been done in preparing for the press No. XVII. of the *Journal*, containing, among other matters, the Meteorology of Scotland for 1899.

Part of the time of the staff is taken up in revising the proof sheets of the hourly observations of the Ben Nevis Observatories now in the press. It need scarcely be added that the revision of the work, which will filled three large quarto volumes, is peculiarly heavy. The work of reduction and entering on daily sheets the hourly observations of the two Observatories is practically brought down to date. The daily maps of rainfall, fog, storms, and other weather phenomena are completed to December, 1899; and for several months, there are already entered on the same maps the details for storms, forecasts, and storm warnings, with which are compared the hourly observations at the Ben Nevis Observatories, with the view of arriving at some definite knowledge of the relations existing among the phenomena observed and the Meteorology of Scotland, particular attention being in the first place given to the relations between the double set of observations made at Ben Nevis, and the forecasts or warnings issued of storms, rain, fog, and the other weather phenomena.

For several months Mr. Omond has had under discussion all hourly temperatures observed at Fort William and the top of the mountain, showing a difference between the two temperatures distinctly less than the usual difference, together with all cases where the temperature at the top exceeded the temperature at Fort William at the time. It will thus be recognised that this work is largely an inquiry into the anti-cyclone, and its connections with the cyclone and weather changes accompanying their changing relations. Mr. Omond gives an account of this work to the meeting of to-day.

34, Drummond Place,
Edinburgh,
17th June, 1901.

DEAR MR. SHAW,

SINCE writing my letter to you of this date, I have received a letter from Lord McLaren, the President of the Directors of the Ben Nevis Observatories, in which he states (as he had before stated to me by word of mouth) "that one of the objects in view in continuing the double series of observations for a period of eleven years, was to test the correspondence of variations of temperature with the prevalence of sun spots, a problem of great interest to astronomers and physicists; and that in the opinion of our Committee, as this is the year of minimum sun spots, it is desirable to continue the observations for another year in order to see whether there will be a change of sign in the variations of temperature corresponding to the change of sign in the variation of solar activity"

I think that you will be pleased to have Lord McLaren's view on this subject, and I beg you to be good enough to communicate it to your Council.

Believe me, &c.,
ARTHUR MITCHELL.

It was resolved that (in reply) a letter be sent to the following effect:—In consequence of the earnest representations of the Directors of the Ben Nevis Observatories the Council have assigned £250 for the continuance of the grant to the Ben Nevis Observatories for the year ending December, 1902, in addition to the sum of £100 granted for the observatory on the summit.

The Council, however, adhere to the decision conveyed in their letter of March 29, 1899, that the Observatory at Fort William cannot be further continued at their cost, and no further grant will be made for that purpose.

76. *Work in the Marine Department* (Minute 70).—The Hydrographer undertook to make a proposal as regards the work of the department after consultation with the Marine Superintendent.

77. *Pilot Charts.*—Read—The following letter (M.O. 978):—

M.O. 978.

Board of Trade,
Marine Department,
June 15th, 1901.

SIR,

WITH reference to your letter of the 1st ult., and to previous correspondence respecting the distribution of Monthly Pilot Charts by Superintendents at certain Mercantile Marine Offices, I am directed by the Board of Trade to transmit to you herewith a statement showing the number of

charts for April and May issued at 29 Mercantile Marine Offices, and the number estimated by Superintendents as sufficient for future requirements, and I am to suggest that 300 charts should in future be delivered monthly to the Storekeeper, Poplar, for distribution to Superintendents.

As regards the suggestion in your letter that Superintendents should retain the charts for two months instead of one, as at present instructed, the Board regret that, if this suggestion were adopted, it would not be possible to check the sums received by Superintendents month by month, by reference to the number of unsold charts returned and charts distributed gratis, and the Board are of opinion that as there does not appear to be any considerable demand for the out of date chart, the difficulty might be satisfactorily met by the Storekeeper retaining the charts for one month before returning them, as indicated in your letter to the Meteorological Office and the Stationery Office respectively.

I am to add that two copies of the circular 51 will be issued in future with each chart, and that the Storekeeper has been requested to send to each Superintendent the same number of Charts marked "Official" as of Charts not so marked.

I am, &c.,
WALTER J. HOWELL.

The Secretary,
Meteorological Office,
63, Victoria Steeet, S.W.

Table showing :—

(1) Number of April and May Charts issued by Superintendents at various Mercantile Marine Office.

(2) Number of Charts estimated by Superintendents as sufficient.

	Issued by Superintendent.		Estimated sufficient.
	April.	May.	
Aberdeen	—	—	6
Blyth	2	—	10
Bristol	3	6	6
Barry	35	30	30
Belfast	—	—	3
Cardiff	27	17	30
Dartmouth	—	3	3
Dundee	3	—	6
Glasgow	2	2	6
Greenock	1	1	6
Grimsby	—	—	—
Gloucester	—	—	—
Hartlepool	—	2	3
Hull	—	2	12
Liverpool	11	20	25
London, Dock Street	—	—	10
„ Poplar	3	4	10
„ Victoria Docks	28	28	30
„ Tilbury	1	1	5
Leith	2	2	10
Manchester	2	1	12
Middlesbrough	3	—	8
Newcastle	3	7	10
Newport	—	4	10
Shields, North	—	—	6
„ South	3	3	12
Southampton	2	—	3
Sunderland	5	2	8
Swansea	3	—	6
Total	139	135	286

It was agreed that the returned copies be stored at the Office or returned to the Stationery Office instead of remaining with the storekeeper at Poplar.

78. *Weekly Weather Report.*—The Secretary reported that he had given directions for the quarterly and annual supplements to the weekly weather report to be continued, with slight modifications necessitated by the completion of a five-yearly period.

Approved.

79. *Daily Means of Temperature.*—The Secretary submitted a memorandum by Mr. R. H. Curtis suggesting the publication of the 30 years' means of daily temperature for the four Observatories, Kew, Aberdeen, Falmouth, and Valencia, which were now completed.

It was agreed to authorise the publication of the means in a separate 8vo. volume, which should also include other means of temperature for long periods for stations in the British Isles.

80. *Inspections.*—The Secretary was authorised to make arrangements for the inspection of certain of the stations in connexion with the Office with the understanding that the inspections should be carried out as far as practicable in July.

An application (M.O. 961) from the Royal Meteorological Society for a grant of £25 towards the cost of inspecting the stations in connexion with that Society was approved on the same terms as last year.

81. *Lloyd's Station at Gibraltar.*—Read—Letter (M.O. 831) from Lloyd's, offering observations from Lloyd's signal station at Gibraltar, about 342 feet above sea level.

The Secretary reported that observations were regularly received from the Army Medical Department's station, which is about 50 feet above sea level, and he was authorised to secure observations from Lloyd's station if a satisfactory arrangement could be made.

82. *Logs.*—Read—A memorandum from the Marine Superintendent stating that since the last meeting six logs had been received, four of them being excellent.

The Secretary was directed to present Charts O. 59 to Captain C. W. Hay, of the R.M.S. Aorangi, and to Captain J. D. S. Phillips, of the R.M.S. Warrimoo, and to return the best thanks of the Council to the other observers.

83. *Storm warnings*—Reported :—

The signals were hoisted on 3 days (10th, 11th, and 12th), the total number of districts warne being 22.

In 6 cases their issue was justified by subsequent fresh or strong gales (force 8 or more), and in 15 by moderate gales or strong winds (force 7 to 6). In only one case were they not required.

GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDERIC GASTER.

84. Submitted the following :—

RETURN of ADMIRALTY INSTRUMENTS in the OFFICE and at HER MAJESTY'S DOCKYARDS for Quarter ending 31st December, 1900.

Place and Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available, 1st Oct., 1900	69	143	125	72	61	40
	Received, new	—	—	—	—	—	10
	„ repaired, cleaned ...	24	26	8	—	—	—
	Total	93	169	133	72	61	50
	Issued	21	53	81	23	23	11
Dec. 30, 1900 ...	Total available	72	116	52	49	38	39

COMPARISON of ESTABLISHMENT and STORE.

Depôts.	Barometers.				Thermometers.							
	Mercurial.		Aneroid.		Ordinary.		Max.		Min.		Screens.	
	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.
Meteorological Office, 1st January, 1901 ...	45	72	120	116	250	52	80	49	80	38	50	39
Portsmouth, 1st January, 1901	25	22	55	49	150	142	50	49	50	55	25	22
Devonport „	25	18	55	53	150	147	50	48	50	48	22	19
Chatham „	25	3	55	9	150	51	50	33	50	31	25	3
Sheerness „	6	5	15	22	30	39	10	15	10	15	10	11
Total	81	48	180	133	480	379	160	145	160	149	82	55
Queenstown, 1st January, 1901	2	2	2	1	3	6	3	1	3	1	—	—
Gibraltar „	2	2	2	—	4	9	3	3	3	3	—	—
Malta „	11	7	15	13	60	55	10	12	10	8	1	—
Bombay „	4	4	3	3	10	—	4	4	4	5	1	2
Halifax „	3	4	4	4	20	19	4	4	4	1	1	2
Bermuda „	3	4	4	8	20	13	4	4	4	5	1	2
Jamaica „	3	3	2	4	10	16	2	—	2	1	1	1
Cape of Good Hope „	4	2	6	2	20	20	4	5	4	2	1	2
Trincomalee „	3	3	3	5	10	21	4	5	4	6	1	1
Hong Kong „	12	4	12	10	30	—	12	9	12	9	2	6
Coquimbo „	2	2	4	2	15	20	2	3	2	4	1	1
Sydney „	5	1	6	—	25	—	6	4	6	6	1	2
Esquimalt „	4	1	5	3	15	2	2	2	2	2	1	2
Total	58	39	68	55	242	181	60	56	60	53	12	21

NET DEFICIENCIES.

Date.	Particulars of Surplus (+) and Shortage (−).	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
1st Jan., 1901	Meteorological Office ...	+27	− 4	−198	−31	−42	−11
	Dockyards—Home	−33	−47	−101	−15	−11	−27
	„ Abroad ...	−19	−13	− 61	− 4	− 7	+ 9
	Net shortage	−25	−64	−360	−50	−60	−29

COMPARISON of EXISTING STOCK of INSTRUMENTS AVAILABLE for ISSUE with ESTABLISHMENT.

1st Jan., 1901	Establishment at—						
	Meteorological Office ...	45	120	250	80	80	50
	Dockyards—Home ...	81	180	480	160	160	82
	„ Abroad ...	58	68	242	60	60	12
	Total Establishment ...	184	368	972	300	300	144
	Net shortage	25	64	360	50	60	29
	Stock available for Issue ...	159	304	612	250	240	115
	„ Ordered	—	—	162	—	—	—
	„ Repairing	29	—	5	—	—	—
	„ Returnable from Depôts	29	29	52	13	17	—
	Total stock	227	333	831	263	257	115

R. F. WALLACE.

85. Reported—That the cash accounts for the quarter ended the 31st March last had been this day examined by Prof. Darwin and Dr. Buchan, and would be sent in due course to the Treasury, for the Audit Office. The receipts from the 1st January last, when there was a balance of £2,433 7*s.* 2*d.*, were £5,318 8*s.* 1*d.*, against £5,128 0*s.* 10*d.* in the corresponding period of the preceding financial year. The payments were £4,629 6*s.* 2*d.* against £4,445 19*s.* 5*d.* during the same period in the previous year. The balance in hand and at the bank on the 31st March, 1901, amounted to £3,122 9*s.* 1*d.*, and at the same date in 1900 to £3,702 11*s.* 11*d.*

86. Submitted—The following statement of accounts:—

	£	*s.*	*d.*
Cash balance on 4th June	3,320	16	1
Receipts from 5th to 18th June	150	9	4
	3,471	5	5
Cheques drawn from 5th to 18th June	143	10	6
Cash balance on 18th June	£3,327	14	11

87. Submitted—The following list of publications which had been received since the last meeting :—

Aitken, John.—Notes on the dynamics of cyclones and anti-cyclones.

B[iggs], J. H. W.—Bowness rain chart, based on Fallbarrow figures. 1883–1900.

Bombay, Government Observatory.—Magnetical, meteorological, and seismological observations made at the Government Observatory, Bombay, in the years 1898 and 1899, under the direction of N. A. F. Moos.

Börnstein R.—Leitfaden der Wetterkunde.

Greenwich, Royal Observatory.—Report of the Astronomer Royal to the Board of Visitors . . . read . . . 1901, June.

Lancaster, A.—Le climat de l'Ardenne.

————————Le climat de la Belgique, 1898, 1899.

————————Données météorologiques recueillies à l'Observatoire Royal de Belgique de 1883 à 1900. Ephémérides météorologiques et naturelles.

————————La direction du vent à Bruxelles d'après cinquante années d'observations. 1842–1891.

————————Résumé des observations météorologiques faites à l'Observatoire Royal de Belgique, à Uccle, pendant les années. 1899, 1900. 2 Vols.

Liverpool Observatory, Bidston.—Report of the Director of the Observatory to the Marine Committee, and meteorological results deduced from the observations taken . . . in the year 1900.

London, Army Medical Department.—Annual abstract of meteorological observations taken at Netley and stations abroad in the year 1899.

————————————————Records of temperature, barometer, and rainfall. Liu Kung Tao, Wei-hai-wei, from August 10th, 1898, to August 9th, 1899.

Magdeburg.—Jahrbuch der meteorologischen Beobachtungen der Wetterwarte der Magdeburgischen Zeitung. Herausgegeben von R. Weidenhagen.

**Millot, C.*—Notions de météorologie utiles à la géographie physique.

Polis, P.—Erläuterung zu den täglichen Witterungsübersichten.

Schiaparelli, G. e Celoria, G.—Posizioni medie per 1870, o di 1119 stelle fino alla grandezza 7^m, 5, comprese fra − 2° e + 6° di declinazione, determinate con osservazioni fatte al circolo meridiano di Starke negli anni 1860–1872. Pubbl. R. Osserv. Brera in Milano. N. xli.

Sydney, Department of Public Instruction.—Results of meteorological observations in New South Wales during 1898.

* Purchased.

63, *Victoria Street, S.W., July 3rd*, 1901.

88. A General Meeting of the Council was held this day.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	THE HYDROGRAPHER.
MR. BUCHANAN.	THE EARL OF ROSSE.
PROFESSOR DARWIN.	PROFESSOR SCHUSTER.
MR. DINES.	MR. SCOTT.

MR. SHAW (*Secretary*).

The Chairman described the reconstitution of the Council by the Royal Society.

Professor Schuster called attention to the regulation with regard to the presentation of the Annual Report and it was understood that the matter would be dealt with at the Statutory General Meeting to be held in the first fortnight of November, as would also the regulations for the distribution of the sum assigned for the remuneration of the Directors under Section III. of the scheme adopted by the Royal Society.

The annual report for the year ended March 31st, 1901, was laid before the meeting.

At the meeting of the Directors held after the General Meeting—

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	THE HYDROGRAPHER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

89. The Minutes of the last meeting (June 19th) were read and confirmed.

90. *Telegrams from Malta.*—Read—the following letter :—

BUREAU CENTRAL, MÉTÉOROLOGIQUE.
Paris, le 24 Juin, 1901.

MON CHER COLLÈGUE,

M. Palazzo, Directeur de l' "Office Central de météorologie de Rome," m'annonce que, dorénavant, les dépêches d' Italie nous seront adressées isolément d' après le nouveau mode de transmission adopté généralement, mais il ajoute que la station de Malte (La Vallette), ne dépendant pas de son bureau, reste exclue de cette combinaison et qu'il cessera par suite de la transmettre.

Comme les observations de cette station présentent pour nous un grand intérêt, je vous demanderai de vouloir bien examiner la question et, s'il est possible, de faire envoyer directement à Paris les observations de Malte.

Veuillez agréer, &c.,

E. MASCART.

à Monsieur Shaw,
Secrétaire du Meteorological Office,
à Londres.

The Secretary was directed to apply to the Colonial Office about the matter.

91. *The Work of the Office.*—Submitted—the following :—

MEMORANDUM ON THE WORK OF THE OFFICE.

12 June, 1901.

1. The programme of work for the past year has been fairly completed, with the exception of that part which concerns the publication of the returns from Foreign Stations. With that no progress has been made. To keep pace with the present work and take up Foreign Stations in addition the staff of the land room must be increased.

2. The programme may be regarded as having been incomplete, (i.) in having made no provision for dealing with the sea temperature observations that have been accumulating for many years, and (ii.) in having made no adequate provision for "Special Researches."

3. There is a great need for an organisation for supplying information to callers. At present, the time of a number of clerks is taken up and their attention distracted by newspaper correspondents and other inquirers for facts which could be appropriately collected in accessible form from the several departments, but are now only to be obtained by personal interviews with those in charge of the departments.

4. The organisation of the telegraph branch is somewhat confused in consequence of its duties being partly statistical and partly "telegraphic." It would be better for the actual telegraphic work to be undisturbed. Very considerable re-organisation would be required if there were any change in the morning hour of observation, and it might be advisable to consider this in conjunction with the organisation of the supply of information to the public.

5. There is very much to be said for a 7 a.m. service of observations and telegrams, *provided special facilities can be obtained from the Post Office.** The observations would be brought into line with those of France and Germany. The time consumed in telegraphy could practically be very much abbreviated—the morning report could be brought out in MS. by, say, 8.30 or 9 o'clock, and the Daily Weather Report printed off and issued in time to catch the day mails to most parts of the country. The arrangement would entail complete revision of the arrangements in the telegraphic department, but the advantages to be gained would be very considerable.

6. The arrangements with regard to self-recording observatories are a little confused. The long established records of pressure, temperature, rainfall, and Robinson-anemometry go into an examination branch, which is more or less independent of the branch responsible for preparing the records for publication ; but Dines-anemometry and sunshine go direct to the pantagraph-room and do not go through an examination branch. I do not see why the records of different instruments should be differently treated, and should consider it an advantage to put the whole of the observatory work under the management of one member of the staff.

7. Further, it is the practice for the official criticisms of the observations to be signed by the Secretary and forwarded to the Observatories ; they are not subsequently referred to. It would be preferable for them to go to the Observatory as "minutes," and be returned to the Secretary to be reported to the Council with any explanations or comments that the observer might have to give. At present the Office has the last word in making a complaint ; with the plan that I suggest the Council would become the final referee as to the complaint and its explanation.

8. It is desirable that the Head of the Observatory branch in the Office should be familiar with the working of self-recording instruments and should occasionally visit Observatories.

9. The availability of the Observatory records would be largely increased if there were facilities for copying selected portions of the records for publication, and for the illustration of papers or lectures. The construction of diagrams and lantern slides will also be of great service. One of the rooms of the Office might, with advantage, be made a photographic dark room, and the photographic reproduction of records and the construction of diagrams might be made a part of regular Office work.

10. The organization of a branch for supplying statistical information to callers and other inquirers would involve

(i.) A room in which an interview could take place without disturbing the work of a department.

(ii.) A member of the staff in charge of the room, with suitable assistance, whose business it should be

(*a*) to know what information the Office possesses and where it is to be found ;

(*b*) to keep posted a book of "records" of all departments such as "highest temperature of the year or month," "lowest temperature," "longest drought," "heaviest rain," &c. ;

(*c*) to receive the latest information from the telegraph and other branches, &c.

* It might be desirable to ask the assistance of the Royal Society for this.

The most appropriate arrangement for such a department would be a large central room as library and museum, with a librarian as the member of the staff in charge of the department, and such maps, &c., displayed as are now exhibited on the staircase. Regarding that as out of the question, some provision might still be made with the present accommodation.

11. The library is now distributed all over the building, and the shelves are overcrowded. I would suggest that some of the original observations which have already been published, practically in full, need no longer be kept in the building, and that an application should be made to the National Physical Laboratory (which is likely to have room to spare for some years) to house a selection of the almost superfluous documents.

12. The Marine Superintendent is of opinion that a Monthly Pilot Chart of the Indian Ocean might be prepared if an additional draughtsman were employed. This work might be combined with diagram work referred to above.

13. With regard to Special Researches, the following subjects deserve consideration.

(1.) The further prosecution of the inquiry into atmospheric electricity.

(2.) The average velocity of the wind over the land is less than over the surrounding seas in consequence of the friction. The stream-lines of air must therefore be very much disturbed by the land. An attempt may be made to trace the stream lines either theoretically or observationally (by means of clouds or otherwise) and to discuss the effect of the disturbance upon sunshine, cloud, and rainfall. The oscillatory nature of the wind records at Scilly, and the corresponding barometric effects might perhaps come into this inquiry, as well as the preference of cyclonic centres for sea areas.

(3.) Some of the most striking phenomena of rainfall and storm occur in small secondary depressions. There has lately been a conspicuous example of the origin and growth of such a secondary depression among the Falmouth records, and probably a careful examination of the origin and growth of such secondaries as shewn in the records of the Observatories would lead to results of practical value.

(4.) It would be desirable to include earth temperatures in the Weekly Weather Reports. Before doing so, or while doing so, it would be desirable to learn how far the recognised modes of observation of earth temperatures are trustworthy. For this purpose experiments with a Callendar recorder comparing the readings on the ordinary method with the Callendar would give valuable information.

(5.) The investigation of the radiation of visible and invisible clouds or air masses. There are all stages of absorption of the sun's rays, from the brilliancy of a clear sun, through haze and mist, to the darkness of a thunder or snow cloud, and, per contra, there must be also corresponding differences in the amount of radiation from these absorbing masses to the earth.

This investigation might take one of two lines :—

(1.) An estimate of the temperature of clouds by measuring their radiation.

(2.) The effect of radiation of clouds upon the state of the weather at the surface.

Suggestion (1.) presumably implies laboratory work.

(2.) could be done partly in the Office and partly elsewhere.

(3.) should be done in the Office with some observations at a First Order station.

(4.) need not be done in the Office.

(5.) is a laboratory investigation, with some practical applications.

Three or four months work at suitable times of the year at any one of these would probably give some valuable results.

14. To carry out this programme I should ask for :—

£50 The raising of the salary limit of two first-class clerkships to £300 a year.

£75 The creation of a new first-class clerkship with the corresponding promotion from the lower grades.

£75 Two additional boy-clerks.

£50 An additional typewriter, and a duplicator, and a female clerk to use them.

£150 The engagement of a "Special Inspector" of adequate scientific attainments, for a limited number of months per annum, but for not more than two years, for one of the subjects of research mentioned.

£200 The change in the time of observation at telegraph stations would probably mean an additional £100 to £200 a year, exclusive of any increase of charge by the Post Office.

Total £600

15. The Office is kept open till 5 p.m. on Saturdays, one half of the clerks being in attendance each Saturday afternoon. I suggest the closing of the Office, except for telegraphic work and any other urgent business, at 1 p.m. on Saturdays, with no luncheon hour. The heads of the different branches may require any member of their staff to stay to complete urgent business, or to return for that purpose, but failing any requirement of that kind the half-day should be given.

16. *Inspection of Stations in England and Ireland.*

It is desirable that the same Inspector should visit the same district for a number of years in succession (say three or four) and during that time see *all* the stations in the district, but not necessarily in any one year. Telegraphic reporting stations and normal climatological stations should be visited twice in three years, and other stations once in four years.

The districts should be :—

(1.) England N.E.

(2.) England N.W. and North Wales.

(3.) England S.W. and South Wales.

(4.) The Home District, within about two hours of London by rail.

(5.) Ireland.

Every Inspector should make himself familiar with the working of Robinson's and Dines' Anemometers and a Barograph, so that it need not be necessary to send Kew Inspectors to the anemograph stations in districts which an Office Inspector also visits.

The inspections should take place generally speaking in July. Inspectors to start on Monday, and the maintenance allowance to run to the following Saturday week or fortnight as may be directed.

I have made five circuits, not six. I think the Secretary would do better to make occasional inspections when something special wants consideration, rather than carry out routine inspections as a general rule.

W. N. S.

The following proposals were approved :—

i. The re-organisation of the Telegraphic Branch under Mr. Gaster, having in view the expediency of changing the morning hour of observation to 7 a.m. as soon as practicable.

ii. The re-organisation of the Observatory Branch under Mr. R. H. Curtis.

iii. The raising of the salary limit of two first-class clerkships to £300 a year for Mr. Gaster and Mr. R. H. Curtis in connexion with the proposed re-organisations.

iv. The creation of a new first-class clerkship to be filled by Mr. Brodie under the new arrangement for the Telegraphic Branch, with corresponding promotions from the lower grades.

v. The transference of two junior clerks or boy clerks to the Telegraph Branch or the engagement of two boy clerks as probationers in the Forecast Branch.

vi. The organisation of a Statistical Branch under Mr. J. A Curtis, including provision for the supply of information to inquirers.

vii. The closing of the Office on Saturdays at 1 p.m. except for forecast work and other urgent business that may arise from time to time.

The Secretary was authorised to make any alterations in the fittings and arrangements of the Office necessary for carrying out the above proposals.

Professor Darwin and the Secretary were appointed a committee to arrange the details of the proposals to be carried out during the vacation.

92. *Work in the Marine Branch* (Minute 76).—The Hydrographer reported that the preparation of monthly wind charts for the Indian Ocean extending to 30° S. to meet

the Meteorological Office publication, Cape to Australia, already issued, was the most useful piece of work for the Marine Branch to take up.

Approved.

93. *Annual Report* (Minute 8).—A draft of the report for the year ended March 31st, 1901, was submitted and approved.

94. *Payment of Female Clerks* (Minute 59).—Resolved—that the payment of female clerks under minute 59 be at the rate of £8 15*s.* per calendar month for Miss Anderson, and £6 12*s.* 6*d.* per calendar month for Miss R. Smith and Miss B. Smith, the arrangement to date from June 1st, 1901.

95. *Pilot Charts.*—It was agreed to send the Monthly Pilot Charts in exchange for the publications of the Société d'Océanographic du Golfe de Gascogne in compliance with the request contained in letter M.O. 1,008 from the President of the Society.

96. *Logs.*—Read—A memorandum from the Marine Superintendent stating that since the last meeting five logs had been received, two of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

97. *Storm Warnings.*—Submitted the following :—

Since the last meeting of the Council there have been no warnings issued to the Coasts of the British Islands, nor have any gales been experienced.

FREDC. GASTER.

Telegraphic Branch,
3rd July, 1901.

98. *Newton Reigny.*—The Secretary reported that he had requested Mr. Benn to continue the morning telegrams from Newton Reigny (*see* Minutes ~~1890–1~~ 1900-1, p. 146) until the close of the Harvest Forecast Season, September 30th.

Approved.

99. *Instruments.*— Submitted the following :—

RETURN of ADMIRALTY INSTRUMENTS in the OFFICE and at HIS MAJESTY'S DOCKYARDS for Quarter ending 31st March, 1901.

Place and Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available, 31st Dec., 1900	72	116	52	49	38	39
	Received, new	—	—	60	13	13	—
	„ repaired, cleaned ...	31	26	5	—	3	—
	Total	103	142	117	62	54	39
	Issued	28	30	54	12	14	4
March 31, 1901 ...	Total available	75	112	63	50	40	35

COMPARISON of ESTABLISHMENT and STORE.

Depôts.	Barometers.				Thermometers.							
	Mercurial.		Aneroid.		Ordinary.		Max.		Min.		Screens.	
	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.
Meteorological Office, 1st April, 1901 ...	45	75	120	112	250	63	80	50	80	40	50	35
Portsmouth, 1st April, 1901...	25	17	55	38	150	118	50	41	50	46	25	19
Devonport „	25	17	55	35	150	130	50	45	50	47	22	20
Chatham „	25	6	55	12	150	62	50	24	50	25	25	11
Sheerness „	6	3	15	18	30	37	10	14	10	14	10	10
Total	81	43	180	103	480	347	160	124	160	132	82	60
Queenstown, 1st April, 1901	2	2	2	4	3	3	3	4	3	4	—	—
Gibraltar „	2	2	2	—	4	9	3	3	3	3	—	—
Malta „	11	10	15	12	60	41	10	12	10	8	1	1
Bombay „	4	4	3	2	10	—	4	3	4	3	1	2
Halifax „	3	4	4	4	20	19	4	4	4	1	1	2
Bermuda „	3	3	4	7	20	9	4	4	4	5	1	2
Jamaica „	3	3	2	4	10	13	2	—	2	1	1	1
Cape of Good Hope „	4	4	6	2	20	18	4	5	4	2	1	2
Trincomalee „	3	4	3	5	10	21	4	5	4	6	1	1
Hong Kong „	12	6	12	11	30	10	12	10	12	11	2	9
Coquimbo „	2	2	4	2	15	20	2	3	2	4	1	1
Sydney „	5	4	6	6	25	18	6	4	6	6	1	2
Esquimalt „	4	4	5	8	15	19	2	2	2	2	1	2
Total	58	52	68	67	242	200	60	59	60	56	12	25

NET DEFICIENCIES.

Date.	Particulars of Surp'us (+) and Shortage (−).	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
1st April, 1901	Meteorological Office ...	+20	− 8	−187	−30	−40	−15
	Dockyards—Home	−38	−77	−133	−36	−28	−22
	„ Abroad ...	− 6	− 1	− 42	− 1	− 4	+13
	Net shortage	−24	−86	−362	−67	−72	−24

COMPARISON of EXISTING STOCK of INSTRUMENTS AVAILABLE for ISSUE with ESTABLISHMENT.

1st April, 1901	Establishment at—						
	Meteorological Office ...	45	120	250	80	80	50
	Dockyards—Home ...	81	180	480	160	160	82
	„ Abroad ...	58	68	242	60	60	12
	Total Establishment ...	184	368	972	300	300	144
	Net shortage	24	86	362	67	72	24
	Stock available for Issue ...	160	282	610	233	228	120
	„ Ordered	—	—	162	—	—	—
	„ Repairing	24	—	—	—	—	—
	„ Returnable from Depôts	19	19	28	13	10	—
	Total stock	203	301	800	246	238	120

R. F. WALLACE.

INSTRUMENTS WANTED to COMPLETE ESTABLISHMENTS at ADMIRALTY STATIONS and M.O.

—	Barometers.		Thermometers.				—
	Mercury.	Aneroid.	Ordinary.	Max.	Min.	Screens.	
Chatham	20	42	86	25	25	6	
Portsmouth	5	6	30	—	—	—	
Hong Kong	5	9	57	9	9	3	For new Establishment
„	6	1	20	2	1	—	To complete old do.
Cape Town	3	2	13	4	4	1	For new Establishment.
„	4	5	7	—	2	—	To complete old do.
Devonport	8	19	20	5	4	2	
Total wanted	51	84	233	45	45	12	
Stock M.O. and repairing	88	75	126	49	50	43	
	+37	− 9	−107	+ 4	+ 5	+31	
M.O. Establishment ...	45	120	250	80	80	50	
Wanted	8	129	357	76	75	19	

PROBABLE COST :—

	£
20 Mercury Barometers	78
150 Aneroids...	394
350 Thermometers = 58 sets in boxes	121
75 Max. do. in boxes pairs	38
75 Min. do. „	38
20 Screens	10
	£679

R. F. WALLACE.

17th June, 1901.

The Secretary was directed to order the necessary instruments and to obtain special terms in consideration of the large numbers to be supplied.

100. Submitted—The following reports of work during the month of June, 1901 :—

MARINE BRANCH.

2nd July, 1901.

Examined 14 new logs.

Discussion of the observations for the region southward from the Equator between the West Coast of Africa and longitude 90° W. Drawing wind-roses for ocean spaces of 5° square, and preparing coastal and ocean wind charts. The coastal charts for June, July, and September sent to press, October for revise, and original charts for November and December sent to engraver.

Examining proofs of, and adding Ice Reports to, the North Atlantic and Mediterranean Pilot Chart for July. The sheets for August and September sent to the lithographer, and the first proof of August examined and sent for revision. Considerable progress made in the preparation of information for the October chart. Obtaining information from Office logs for the Atlantic north of 50° N. to supplement the wind and fog data from other sources.

Obtaining information with respect to the amount of material in Office logs, &c., available for the Indian Ocean.

Hydrographical notices from the log of the s.s. "Warrimoo" copied and forwarded to the Admiralty; and several reports of ice in the neighbourhood of Newfoundland sent for publication in the *Shipping Gazette*.

Assistance given to the Telegraph Branch in distributing copies of the Daily Weather Reports to the railway bookstalls.

CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

CAMPBELL HEPWORTH.

Examination Branch.

1st July, 1901.

Examinations.

January, 1900.—Proceeded with.

May, 1900.—Fort William work.

April and May, 1901.—Valencia work proceeded with.

Weekly examinations (on receipt) of curves and documents from all observatories.

Reports, &c.

May, 1900.—Copies of "Notes of Errors" to Fort William.

Investigation *re* Fort William Barometer readings and residuals.

The returns from Fort William have been received to 14th July, 1900.

T. E. Allen.

Pantagraph Room.

1st July, 1901.

Hourly Means.—Volume for 1898. Proofs have been passed for press as far as page 48. The calculation of the remainder of the tables has been finished, but the results for Kew require to be copied for the printer.

Daily Means of Temperature.—The extension of these Mean values from a period of 25 years to 30 years has now been completed; a plan has been prepared for their publication, and the work of copying them for press has been begun.

Miscellaneous.—Prepared new forms for pressure-tube, and bridled anemograms, and examined proofs. Prepared table of gales for Annual Report. Occupied *re* Anemometers and Sunshine recorders for the Antarctic Expedition Inspected Sunshine Station at Plumstead. Prepared a plan of a proposed instrument for testing Sunshine Recorders *in situ*. Tables for Annual Report, and reading proof, &c.

Enquiry.—By Mr. A. Craven, of Bradford, as to wind force on June 17th in Irish Sea.

R. H. Curtis.

Land Room.

3rd July, 1901.

Enquiries during June, 1901.

1. Mr. Craven.—As to the force of the wind at Fleetwood on certain days in June, 1901. (M.O. 997.)

John A. Curtis.

In addition to the enquiries referred to above, there were 25 personal enquiries during June for forecasts or other weather information, and 24 enquiries by telegraph.

Monthly Return of "A." Instruments on Charge.

30th June, 1901.

——	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Terr. Radiation.						
Dr.													
On Charge, 1st June ...	49	70	81	62	61	—	—	43	45	2	—	—	
Received since ...	10	7	18	6	3	—	—	—	—	—	—	—	
	59	77	99	68	64	—	—	43	45	2	—	—	
Cr.													
Sent out during month	19	27	51	16	16	—	—	3	—	—	—	—	
On Charge, 1st July ...	40	50	48	52	48	—	—	40	45	2	—	—	

July, 1901.

R. F. Wallace.

MONTHLY RETURN OF "M.O." INSTRUMENTS ON CHARGE.
30th June, 1901.

	Barometers.	Aneroids.	Thermometers. Ordinary.	Maximum.	Minimum.	Solar Radiation.	Terr. Radiation.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
Dr.													
On Charge, 1st June ...	22	3	83	15	16	2	8	24	99	7	2	8	1 Sphere.
Received since ...	7	1	25	9	—	—	—	2	8	—	—	—	2 Sunshine Recorders, 6 Spheres. Part of the Instruments for Antarctic Expedition, 1901.
	29	4	108	24	16	2	8	26	107	7	2	8	
Cr.													
Sent out during month	5	—	31	4	—	—	—	4	21	—	1	—	Part of the Instruments for Antarctic Expedition, 1901.
On Charge	24	4	77	20	16	2	8	22	86	7	1	8	2 Sunshine Recorders, 7 Spheres.

July, 1901. R. F. WALLACE.

101. Submitted—The following Statement of Accounts :—

	£	*s.*	*d.*
Cash balance on 18th June	3,327	14	11
Receipts from 19th June to 3rd July	40	10	10
	3,368	5	9
Cheques drawn from 19th June to 3rd July ...	1,274	1	11
Cash balance on 3rd July	£2,094	3	10

102. Submitted—The following list of publications, which had been received since the last meeting :—

Bermuda, Registrar General's Office.—Report of the Registrar General for the year 1900.

Birkeland, Kr.—Expédition Norvégienne de 1899-1900 pour l'étude des aurores boréales. Résultats des recherches magnétiques.

Blackpool, Medical Officer of Health.—Annual report on the health of Blackpool for 1900.

Calcutta, Meteorological Office, Bengal.—Summary of the meteorology of Bengal for the year 1900.

———————————*India.*—Memorandum on the snowfall in the mountain districts bordering Northern India and the abnormal features of the weather in India during the past year, with a forecast of the probable character of the south-west monsoon rains of 1901.

Christiania, Norsk Meteorologisk Institut.—Nedböriagttagelser i Norge. Aarg. vi. 1900.

Cracow, C. K. Akademii Umiejętnósci w Krakowie.—Materyały do klimatografii Galicyi zebrane przez sekcyę meteorologiczną komisyi fizyograficznej . . . 1900.

Falmouth Observatory.—Meteorological and magnetical tables and reports for the year 1900; also additional meteorological tables for Falmouth for six consecutive lustra, 1871 to 1900, and tables of sea temperature, by W. L. Fox and E. Kitto.

Hamburg, Deutsche Seewarte.—Deutsche ueberseeische meteorologische Beobachtungen. Heft 10. Meteorologische Beobachtungen in Deutsch-Ost-Afrika gesammelt und bearbeitet von Dr. H. Maurer. Theil 1. Aufzeichnungen der Registrir apparate.

Jansson, M.—Über die Wärmeleitungsfähigkeit des Schnees.

Kiel and Heligoland. Kommission zur wissenschaftlichen Untersuchung der Deutschen Meere in Kiel und der Biologischen Anstalt auf Helgoland.—Wissenschaftliche Meeresuntersuchung. Neue Folge. Fünfter Band. Abtheilung Kiel.

Krebs, W.—Luftwogen über Mitteleuropa am 7. Juli 1894.

———————Die meteorologischen Ursachen der Hochwasser-Katastrophen in den Mitteleuropäischen Gebirgsländern.

Lockyer, W. J. S.—The solar activity 1833-1900.

Milan, R. Osservatorio Astronomico di Brera in Milano.—Osservazioni meteorologiche eseguite nell'anno 1900, col riassunto composto sulle medesime da E. Pini.

Oxford, Radcliffe Observatory.—Results of meteorological observations made at the Radcliffe Observatory, Oxford, in the eight years 1892–1899. Edited by A. A. Rambaut.

St. Petersburg, Central Physical Observatory.—Report of the Nicolas Central Physical Observatory for 1899.

———————*Observatoire Physique Central Nicolas.*—Annales . . . publiées par M. Rykatchew, 1899. Parties i–ii.

San Salvador, Observatorio Astronómico y Meteorológico.—Anales. 1895.

63, *Victoria Street, S.W., October* 23, 1901.

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	THE HYDROGRAPHER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

103. The Minutes of the last meeting were read and confirmed.

104.—*The Work of the Office.*—The Secretary reported that, after consultation with Professor Darwin in pursuance of the resolutions of Minute 91, he had given instructions for the following changes in the arrangements of the office and the work carried on :—

I.—GENERAL.

i. The closing of the office, except the forecast branch, at 1 p.m. on Saturdays, from October 5, in the absence of any urgent business, by arrangement on each occasion between the members of the staff and the senior clerks in the several branches or, in the absence of the senior clerk, the chief clerk.

ii. The construction of two storage places with Willesden canvas covers in the attic space of the roof for sunshine cards and other documents at an estimated cost of £14 19*s.*

iii. The provision of a rack in the basement for the more convenient storage of surplus copies of publications at an estimated cost of £11 12*s.*

II.—STATISTICAL BRANCH.

iv. The re-arrangement of Room 2 by the removal of the partition at an estimated cost of £19 11*s.*, and various alterations in the presses and the electric light for the accommodation of a Statistical Branch in the charge of Mr. J. A. Curtis, with Mr. T. D. Bell as Librarian, Mr. Rigby, Mr. A. H. Bell, Mr. Heinemann, Mr. Bracey, and Messengers to discharge the following duties :—

(*a*) The preparation of statistics for the Weekly Weather Report and its Supplement and other work of a similar character.

(*b*) The preparation of an annual volume of observations at stations of the Second Order and a periodical volume of observations at Colonial and Foreign stations.

(*c*) The distribution of the daily and weekly Weather Reports and other publications of the Office.

(*d*) The care of the Library.

(*e*) The preparation of information in reply to inquiries by letter or in person.

v. The provision of a showcase at an estimated cost of £15 9*s*. 8*d*. for instruments, charts, &c.

vi. The provision of a ventilation flue in the Lavatory adjoining Room 2 with similar provisions for the Lavatories above it at an estimated cost of £[25 14*s*].

III.—Forecast and Storm Warning Branch.

vii. The preparation of Rooms 9 and 10 for the accommodation of the Forecast and Storm Warning Branch. The removal of the present tape-instrument to Room 10, the installation of a Switch in Room 10, a new tape-instrument in Room 9 and a Sounder in Room 5 (the Secretary's Office) at an estimated cost of £14 12*s*. 6*d*. per annum the charge made by the Post Office for maintenance.

viii. The appointment as from October 14 of H. Prickett, aged 17 years, boy-clerk in the Marine Department, at a commencing salary of 15*s*. 6*d*. per week, and of W. Hayes, aged 16 years, of Owen's School, Islington, at a commencing salary of 14*s*. per week as probationers after inquiry into their qualifications and an examination in Geography, Map Drawing and the reading of instruments among seven selected candidates.

ix. The division of the staff entrusted with forecast duty into two shifts consisting in the first instance of (1) Mr. Brodie, Mr. Francis, Mr. Hayes; (2) Mr. Sargeant (acting for Mr. Gaster), Mr. Simpkins, and Mr. Prickett with hours of attendance, on and after November 1, from 8 a.m. to 4 p.m. (Saturdays 1 p.m.) and from 2 p.m. to 8.30 p.m. (Saturdays 1 p.m. to 8 p.m.) respectively in alternate periods of three weeks, the Sunday duty to be taken as at present by two clerks in turn. Mr. Gaster to be in charge of the branch with a salary of £300 per annum and Mr. Pycock to be attached to the branch as attendant.

x. The promotion of Mr. Brodie to a first-class clerkship with a commencing salary of £225 a year.

xi. The promotion of Mr. Sargeant to the second-class clerkship vacant by Mr. Brodie's promotion, with a commencing salary of £175.

xii. The promotion of Mr. Simpkins to the third-class clerkship vacant by Mr. Sargeant's promotion, with a commencing salary of £125 a year.

xiii. Additional payments to the staff on forecast duty of 1½ per cent. of the fixed monthly payment for each week of early attendance, and of 4½ per cent. for each week of late attendance, and of 5¾ per cent. for each Sunday attendance during the month.

xiv. The opening of a private wire from the Post Office at 8 a.m. instead of 8.30 a.m. at an estimated cost of £13 13*s*. per annum.

xv. The provisional division of duty between the shift in early attendance and the shift in late attendance as follows :—

The shift in early attendance :—

Forenoon :—Reading of the Office Instruments at 8 a.m.

Preparation, for the Secretary, of a comparison of the evening forecast with the 8 a.m. weather.

Preparation of the Daily Weather Report and the work in connexion therewith.

Afternoon :—Preparation of the Weekly Weather Report maps, &c.

The shift in late attendance :—

Reading of office instrument at 2 p.m. and 6 p.m.

Checking storm warnings.

Examination and tabulation of observatory records.

Preparation and issue of the evening reports, &c.

IV.—The Marine Branch.

xvi. The appointment of H. E. Carter, aged 15 years, of the school in connexion with the South London Polytechnic, the candidate next on the list for selection in the examination for probationers, as a boy clerk at a salary of 12*s*. 6*d*. per week from October 21st, with the understanding that he would act as an additional member of one of the Forecast shifts in the absence of a member of the shift.

V.—The Secretary's Office.

xvii. The transfer of the account books of the instruments to the inner instrument room, the provision of electric light in the instrument rooms and the office keeper's room at an estimated cost of £5 18*s*. 7*d*.

xviii. The provision of a gas stove for the inner instrument room at an estimated cost of £1 11*s*. (exclusive of fixing) and the provision of other requirements for furnishing the room.

xix. The provision of a sounder already mentioned for the despatch and receipt of telegrams between 9 a.m. and 5 p.m.

xx. The transfer of Mr. Snell to the Secretary's office as telegraphist, &c.

VI.—THE OBSERVATORY BRANCH.

xxi. The suspension of the re-organisation of the Observatory Branch until the completion of the tranfer of the work of the Statistical and Forecast branches, the outstanding arrangements to take effect on November 1 being

The transfer of the work of the Examination Branch to the Observatory Branch.
The transfer of Mr. Allen to the Secretary's office.
The transfer of Mr. Bench to the Observatory Branch.

(1) The arrangements enumerated above (i-xxi) were approved.

(2) It was resolved that the first increase of £5 in Mr. R. H. Curtis's salary under Resolution iii. of Minute 91 date from October 1st, 1901.

(3) The Secretary was authorised to employ Mr. Rigby and Mr. Francis for work at overtime in connexion with the arrears of work in the Observatory and Statistical branches to the extent of £25 per annum each.

105. *Messengers.*—The Secretary reported that Commissionaire T. Morgan had been accepted for appointment as messenger, on the recommendation of the Commandant, from August 19th in place of Commissionaire Hallinon.

106. *Inquiry into the Occurrence and Distribution of Fogs in London.*—Read—the following letter :—

M.O. 1597.

County Hall, Spring Gardens, S.W.,
19th October, 1901.

SIR,

REFERRING to your letters of the 21st November, 1900, and 19th July last, with reference to the proposed inquiry into the occurrence and distribution of fogs in the London district, and their relation to other atmospheric and local conditions, and to the interviews which my representatives have had with you on the subject, I have now to inform you that the General Purposes Committee, by whom the matter has been considered, has decided to recommend the Council to accede to the suggestion of the Meteorological Council and to recommend a contribution of £250 for the purposes of the investigation.

I enclose a copy of the report which will be submitted to the Council, from which you will see that there is no power to expend the money during the present financial year, but I understand that if the assurance which will be given if the recommendation of the Committee is adopted, the Meteorological Council will probably be prepared to at once take steps to institute the inquiry.

I should be much obliged if you would kindly inform me whether that supposition is correct.

The report will be submitted to the Council on Tuesday next, and I will let you know on Wednesday morning whether the Council has adopted the report and recommendation.

I am, &c.,
G. C. GOMME,
Clerk of the Council.

The Secretary,
Meteorological Office.

LONDON COUNTY COUNCIL.

EXTRACT FROM THE REPORT OF THE GENERAL PURPOSES COMMITTEE TO THE COUNCIL ON 22ND OCTOBER, 1901.

Inquiry into the occurrence and distribution of fogs in London.

1. We have had under consideration a letter from the Secretary of the Meteorological Office, stating that it is proposed to hold an inquiry into the occurrence and distribution of fogs in the London district, and their relation to other atmospheric and local conditions, and asking for the co-operation and assistance of the Council in the conduct of the inquiry. The Meteorological Council make the suggestion consequent on applications which have been received from the electric supply department of one of the local authorities and from some of the electric supply companies of London for special forecasts or warnings of the approach of fogs ; and on account of the general importance of the subject to the inhabitants of London. It is pointed out that the occurrence and distribution of fog are subject to variations of so local and apparently so capricious a character that the general forecasts drawn up for the south of England do not meet the requirements of the case ; and the information that can at present be procured from day to day by the Meteorological Office is not sufficient to justify an attempt to issue such special forecasts of fog for the individual districts of London as would meet those requirements.

The Meteorological Council are fully conscious of the importance of a more precise knowledge of the conditions which govern the distribution of fog, not only for the lighting industry, but for many other interests of the population of London, but the funds at their disposal are not sufficient for the investigation of the local details of the atmospheric conditions on which the formation of fog depends in individual districts. These funds, we understand, are not more than sufficient to enable the Office to deal generally with the meteorology of the British Isles and neighbouring seas and of the oceans traversed by British ships, for which objects the parliamentary grant was from the outset specifically appropriated, and the Meteorological Council has no staff at its disposal by whom local investigations could be undertaken.

The mode of procedure suggested by the Meteorological Office is the initiation of a special inquiry during the winter months into the conditions associated with the development and distribution of fog in London and its vicinity; and for that purpose (1) to obtain records from properly selected positions in various parts of London; (2) to collate these records with the general atmospheric conditions at the time of the observations as shown by the information regularly furnished to the Office; and (3) as far as possible to ascertain the character of the information requisite for anticipating the occurrence of fogs in particular localities.

The Meteorological Council suggest that it would not be beyond the province of the London County Council to provide the means of undertaking such an enquiry, which could not be satisfactorily carried out without the co-operation of many local authorities or bodies, and which in itself is one that might be reasonably expected to lead to ameliorations of some importance of the conditions of life in the London area. The Council is therefore asked to provide for the special expenses incidental to the inquiry and for the keeping of suitable records in the several districts, the Meteorological Council, for their part, undertaking the superintendence of the inquiry and affording any facilities which the organisation of their office enables them to supply. As a matter of fact the subject has already received the attention of the medical officer and the chief officer of the Fire Brigade, and the firemen of the Council are trained to take the necessary observations which are daily made at some of the fire stations.

We have carefully considered the proposal made by the Meteorological Office, and there can be no doubt that the benefits that would be derived by the inhabitants of London and its vicinity would be immeasurable if the evil effects arising from the occurrence of fog could even to a slight extent be guarded against. It would therefore seem desirable that every facility should be given by the Council for an inquiry to be made of the nature suggested. The matter has been carefully considered and the following course of action is proposed—

1. That a gentleman of suitable scientific qualifications be engaged by the Meteorological Council for a limited period to formulate instructions and a scheme of observations, and to conduct the investigation.
2. That the observations be taken at the various fire brigade stations and by men of the fire brigade; and also, if it can be so arranged, at other institutions of the London County Council.
3. That the returns be sent from the various stations (and any other institutions selected) direct to the Meteorological Office.
4. That the Meteorological Council do arrange with the police authorities for observations to be taken at selected positions outside the county of London.
5. That all responsibility as to the conduct of the investigation and any published results of such investigation do rest with the Meteorological Council.
6. That a copy of the complete returns and 12 copies of a report thereon by the Meteorological Council be supplied to the London County Council, and that the Council do contribute a sum of £250 for the investigation.

We are of opinion that these proposals would represent a satisfactory and practicable arrangement; and we understand that the Fire Brigade Committee would raise no objection to the use of the fire stations and men as proposed, and that the chief officer of the fire brigade is prepared to conduct the work so far as the brigade is concerned, provided the instruments intended to be used for the observations are the ordinary hygrometric instruments such as are used in the Royal Navy.

As we have said, we are strongly of opinion that if the evil effects arising from the occurrence of fog could even to a slight extent be guarded against, a very great benefit would be conferred upon the inhabitants of London, and we think the Council may properly accede to the proposal of the Meteorological Office.

As regards the powers of the Council to make the proposed contribution of £250, the solicitor advises that the only way in which the Council could expend that sum for the present purpose would be to take advantage of the power conferred on the Council by the General Powers Act of 1893 to expend the sum of £1,000 in any one year in investigating subjects of general importance to the inhabitants of the county. The £1,000 for the present financial year has been already appropriated, and the Council is therefore unable to make the contribution until April next. We understand, however, that provided they are given an assurance that the Council will be prepared to contribute the sum mentioned, the Meteorological Council will probably be prepared to at once take steps for instituting the inquiry; and having regard to the desirability of obviating the loss of a year before commencing the investigations, we have decided to recommend the Council, in accordance with Standing Order No. 269, to sanction (subject to the passing at the annual maintenance vote) an expenditure next year of a sum of £250.

We have submitted to the Finance Committee, as required by the standing order, a memorandum intimating our intention of submitting the present report, and now recommend—

(*a*) That the Council do concur in the suggestion that it should assist, on the lines set out in the above report, in the initiation of a special inquiry into the conditions associated with the development and distribution of fog in London and its vicinity, on the

understanding that all responsibility for the conduct of such investigation do rest with the Meteorological Council.

(*b*) That, subject to the passing of the annual maintenance vote, the Council do contribute in the next financial year a sum of £250 for the investigation.

also a letter from the Clerk to the County Council, dated 22nd October, 1901, stating that the report of the General Purposes Committee had been adopted by the Council.

It was resolved that steps be at once taken to institute the inquiry and the Secretary was directed to report upon the matter at the next meeting.

107. *Deutsche Seewarte 7 a.m. Reports* (Minute 3 of March 12.—The Secretary reported the receipt of a return from the Post Office giving particulars of the additional cost of a service of telegrams at 7 a.m. from British Stations, amounting altogether to £193 per annum, and submitted the following statement of weekly payments as now authorised to Telegraphic Reporters, &c. for Meteorological Observations, made directly or through the Post Office, including allowances for Sunday attendance at extra-official hours, &c. :—

Reporting Stations.	Transmitting Stations.	Payments for Ordinary Telegrams.		Payments for 7 a.m. Telegrams.		
		M.O.	P.O.	M.O.	P.O.	Proposed Additional Stations.
Aberdeen	—	7*s.* 6*d.*	—	—	—	—
	Aberdeen ...	—	2*s.*	—	—	3*s.* 6*d.*
Birr	—	5*s.*	—	—	—	—
	Birr	—	—	—	—	No charge.
Blacksod Point ...	—	6*s.*	—	£8 per annum.	—	—
	Blacksod... ...	—	1*s.*	—	7*s.*	—
	Belmullet ...	—	1*s.*	—	7*s.*	—
Christiania	—	£5 10*s.* per quarter.	—	—	—	—
Donaghadee... ...	—	6*s.*	—	—	—	—
	Donaghadee ...	—	1*s.* 6*d.*	—	—	1*s.*
Dungeness	—	7*s.*	—	—	—	—
	Dungeness ...	—	1*s.*	—	—	No charge.
Dunrossness ...	—	6*s.*	—	—	—	—
	Dunrossness ...	—	2*s.*	—	—	7*s.* 6*d.*
	Lerwick... ...	—	2*s.*	—	—	—
Holyhead	—	6*s.*	—	£8 per annum and 6*d.* weekly for porterage.	—	—
	Holyhead ...	—	—	—	—	No charge.
Jersey	—	6*s.*	—	—	—	—
	St. Aubin's ...	—	1*s.*	—	—	4*s.*
Leith...	—	—	7*s.* 6*d.*	—	—	2*s.* 6*d.*
Liverpool	—	—	—	—	—	No charge.
London :						
Brixton	—	6*s.*	—	—	—	—
Messenger ...	—	1*s.* 3*d.*	—	—	—	—
Wesleyan Training College.	—	2*s.* 6*d.*	—	—	—	—
Messengers ...	—	[1*s.*]	—	—	—	—
	Central Telegraph Office.	—	1*s.*	—	—	—
Loughborough ...	—	5*s.* 6*d.*	—	—	—	—
	Loughborough ...	—	—	—	—	No charge.
Malin Head... ...	—	7*s.* 6*d.*	—	—	—	—
	Malin	—	1*s.*	—	—	1*s.*, and £1 per annum for Sunday Reports.
Nairn	—	6*s.* 6*d.*	—	—	—	—
	Nairn	—	1*s.*	—	—	No charge.
North Shields ...	—	—	6*s.* 6*d.*	—	£8 per annum.	No charge.
Oxford	—	5*s.* 6*d.*	—	—	—	—
	Oxford	—	—	—	—	£1 10*s.* per annum and £3 15*s.* 4*d.* for Sunday Reports.

Statement of Weekly Payments—*continued.*

Reporting Stations.	Transmitting Stations.	Payments for Ordinary Telegrams.		Payments for 7 a.m. Telegrams.		
		M.O.	P.O.	M.O.	P.O.	Proposed Additional Stations.
Portland Bill ...	—	6*s.*	—	—	—	—
	Easton	—	1*s.*	—	—	4*s.* 4*d.*
	Weymouth ...	—	6*d.*	—	—	—
Roches Point ...	—	—	6*s.* 6*d.*	—	—	7*s.*
St. Ann's Head ...	—	5*s.*	—	—	—	No charge.
Scilly	—	10*s.*	—	£8 per annum.	—	—
	Scilly	—	1*s.*	—	6*d.*	—
Spurn Head... ...	—	5*s.*	—	—	—	—
	Spurn Head ...	—	—	—	—	2*s.* 6*d.*
Stornoway	—	6*s.*	—	£8 per annum.	—	—
	Stornoway ...	—	2*s.*	—	—	No charge.
Valencia	Private Wire and Telephone.	£15 5*s.* per annum.	—	—	—	—
	Cahirciveen ...	—	1*s.*	—	7*s.*	—
Wick...	—	5*s.*	—	£8 per annum.	—	—
	Wick	—	1*s.*	—	1*s.*	—
Yarmouth	—	6*s.*	—	—	—	—
	Yarmouth ...	and 1*s.* per month for porterage on Sundays.	—	—	—	2*s.* 6*d.*, and 1*s.* 5*d.* per week for Sunday Reports.
M.O.	Private Wire ...	£22 per annum.	—	—	—	—
	Rental of New Instruments.	—	—	—	—	—
	Opening Wire at [7.30].	—	—	—	—	10*s.* 6*d.*

In addition to the above, varying amounts for postage and other incidental charges are allowed, and in the case of those observers whose reports have been trustworthy during the year an annual bonus of £3 3*s.* is paid.

It was resolved that, after inquiry as to the facilities that could be afforded, application be made to the Royal Society to approach the Government with the view of obtaining an arrangement with the Post Office for a 7 a.m. service of telegrams on more economical terms and for accelerating the weather telegrams generally.

108. *Weekly Article for the Fish Trades Gazette.*—Under the provisional arrangement authorised by Minute 8 of March 26—namely that the work should be done out of office hours by the Marine Superintendent or some member of the Marine Department acting for him—authority was given for the amount received for the weekly article for the Fish Trades Gazette to be handed over to the authors of the articles furnished ; and the continuance of the arrangement was approved.

109. *Telegraphic Reports from Malta* (Minute 90).—Read the following letter :—

M.O. 1233.

Downing Street,
30th July, 1901.

SIR,

I AM directed by Mr. Secretary Chamberlain to inform you that a copy of your letter of the 18th instant, No. 1025, respecting the daily transmission of a weather telegram from Malta to the Bureau Central Météorologique at Paris, has been referred to the Officer Administering the Government of Malta for favourable consideration.

I am, &c.,
H. BERTRAM COX.

The Secretary,
Meteorological Office.

The Secretary was directed to inquire whether any reply from Malta had been received at the Colonial Office.

110. *Publication of Reports from Colonial and Foreign Stations.*—Read the following letter :—

M.O. 1580.

2, York Mansions,
Battersea Park, S.W.,
October 22nd, 1901.

DEAR SIR,

IN consequence of a short conversation I had with you at Glasgow, I venture to suggest :—

Firstly.—That the climatological work done during the last 10 years by a Committee of the British Association, of which I was chairman, shall in future be carried on by the Royal Meteorological Council, and be extended to all H.M. Crown Colonies and Protectorates.

Secondly.—That the results of all meteorological observations thus obtained be published *annually* in abstract, as a rule, but *in extenso* where of sufficient interest.

I need hardly point out to you the main advantages of transferring this important department of scientific inquiry from a Committee of a private association to a duly recognised Government department, able to enforce its instructions, where the former was able merely to suggest.

If, as I understand, the Staff of the Meteorological Council is at present inadequate for undertaking these additional duties, I shall be willing to give my co-operation.

I remain, &c.,
E. G. RAVENSTEIN.

The Secretary was directed to report upon the matter at a future meeting.

111. *Publications.*—The Secretary reported a request from the Cambridge Philosophical Society for a copy "the Quarterly Volume issued by the Office" in exchange for the publications of the Society.

Authority was given for sending publications selected by the Society for preservation in their library.

112. *Sabang Bay.*—Reported receipt of a letter (M.O. 1168) to the effect that some of the instruments sent out in accordance with Minute 4 of February 26 had been broken in transit.

It was resolved to send a new maximum thermometer and grass minimum thermometer but not a solar maximum.

113. *Republication of Official No.* 59.—A proof submitted in accordance with Minute 48 was approved.

114. *Pilot Charts.*—Read—the following letter :—

M.O. 1358.

31st August, 1901.

SIR,

I AM desired by the Controller to acknowledge the receipt of your letter of the 9th instant, and in reply to suggest that, as the sale of the Charts has not come up to expectations and is apparently decreasing, the number printed shall be at once reduced as far as practicable. In the meantime the question of the disposal of surplus copies will be considered. The cost of printing these charts for the four months, April to July, was nearly £20 per month.

I am, &c.,
E. P. PLOWMAN,
Assistant Controller.

The Secretary,
Meteorological Office.

115. *Tests of Aneroids.*—Read—the following letter :—

M.O. 1525.

The National Physical Laboratory,
Old Deer Park,
Richmond, Surrey,
5th October, 1901.

DEAR MR. SHAW,

WE have recently issued a new edition of our "Tests and Certificates,' a copy of which has been sent you. You will notice that we have reorganized, to some slight extent, our aneroid test—or rather the particulars published. Consequently we have in hand new forms of certificate. As we

are so engaged, we think of getting out a suitable form for the M.O. aneroids, which have, as you know, a test of their own. We are nearly run out of our existing forms and so must set about this without delay. Before ordering new certificates to fit the existing M.O. test, I should like to be sure that you contemplate no immediate change in the character of the test.

In our new certificate for aneroids with pressure scale only, I think we shall give (1) corrections with pressure falling, (2) sum of differences between descending and ascending readings, (3) correction under atmospheric pressure when test concludes and 24 hours after, and add some general remarks.

You have several special tests which do not come in the general certificate's compass.

Yours faithfully,

CHARLES CHREE,
Superintendent Observatory Department.

The Secretary,
Meteorological Office.

The Secretary was directed to ask for suggestions from the National Physical Laboratory as to the revision of the test certificate.

116. *Breakage of Instruments in Transit.*—Reported—that the London and South Western Railway had declined (M.O. 1146) to admit any responsibility for damage, amounting to £2 10*s.*, to two barometers and a thermometer in transit to Portsmouth.

117. *Instruments Ordered.*—Reported—that the stock of M.O. thermometers having been considerably reduced on account of the establishment of a number of new land stations as well as various renewals to ships of the Mercantile Marine, 108 new thermometers costing £29 9*s.* 6*d.*, have been ordered since the last meeting of Council.

Approved.

118. *Telegrams from Newton Reigny* (Minute 98).—The Secretary reported that he had requested Mr. Benn to continue his daily telegram until December 31st.

Approved.

119. *Telegraphic Stations: Birr.*—Reported—that from September 1st J. S. Roe had acted as telegraphic observer under Dr. Böddicker at Birr Castle.

Approved.

120. *Telegraphic Stations: Roche's Point.*—The Secretary reported that he had agreed to accept on behalf of the Council a temporary letting of the enclosure at Roche's Point from Lord Fermoy in accordance with the terms of the following letter:—

M.O. 1147.

7, Leinster Street, Dublin,
15th July, 1901.

ESTATE OF LORD FERMOY.

SIR,

AN enclosure of 70′ square has been made at Roche's Point in which your instruments are situated. This enclosure is considerably larger than the former one, and it now embraces a site selected by the War Office for a search light for the better protection of Queenstown Harbour. We may say that the War Department have at present abandoned the idea of these search lights, still we must keep ourselves free to give them any site they may select, and for this reason we have to ask you to accept of a temporary letting of the site at Lord Fermoy's pleasure, and at the nominal rent of 1*s.* per annum, the first years rent to be due and payable on 1st November next. We await your reply agreeing to this, and remain, Sir,

Yours faithfully,

J. S. KINCAID & SONS,
Agents to Lord Fermoy.

The Secretary,
Meteorological Society,
63, Victoria Street,
London.

Approved.

121. *Telegraphic Stations: Stornoway.*—It was resolved to decline to accede to the request of the observer at Stornoway (M.O. 1606) for an increase of payment.

122. *Anemometer Equivalent of Beaufort's Scale.*—In compliance with a request from the Mersey Docks and Harbour Board (M.O. 1571) it was resolved to take into consideration the issue of a revision of the equivalents of the Beaufort Scale contained in the Board of Trade Circular, No. 558.

The Secretary was directed to report upon the matter.

123. *Magnetic Observations at Valencia.*—The Secretary reported that at Lord Rosse's request he had given directions for the magnetic observations to be continued until February 5, 1902, on the same terms as before (Minute 3 of January 16).

Approved.

124. *Publication of Temperature Tables.*—A specimen of the tables and diagrams of day to day mean variation of temperature for thirty years at four observatories and of mean diurnal variations for twenty-five years to accompany the tables were approved.

125. *Suggested shortened form of Log.*—Submitted—a memorandum from the Marine Superintendent upon a shortened form of log.

The consideration of the matter was postponed.

126. *Logs.*—Read a memorandum from the Marine Superintendent stating that since the last meeting 40 logs had been received, 13 of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers, and to present Charts, Official No. 59, to Capt. D. McAllister of the s.s. "Bhamo," and Charts, Official No. 106, to Capt. F. C. A. Lyon, R.N.R., of the P. & O. s.s. "Victoria."

127. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council.

WARNINGS ISSUED.

In July there were none.

In August the signals were hoisted on 4 days, the total number of districts warned being 21. In 5 districts the warnings were justified by subsequent gales, and in 7 districts by strong winds. In 9 districts they were not required.

In September the signals were hoisted on 9 days, the total number of districts warned being 58. In 18 districts the warnings were justified by subsequent gales, and in 21 districts by strong winds. In 19 districts they were not required.

In October the signals were hoisted on 4 days, the total number of districts warned being 22. In 10 districts the warnings were justified by subsequent gales, and in 8 districts by strong winds. In 4 districts they were not required.

GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDERIC GASTER.

128. Submitted—The following Statement of Accounts for the quarter ending 30th June, 1901:—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1900–1901	—	3,122 9 1	ADMINISTRATION:		
Proportion of vote ...	—	3,500 0 0	Secretary	150 0 0	
Repayment of expenses charged under—			Salaries and wages ...	229 7 0	
(1.) Incidental expenses	1 3 11		Rent, fuel, and lighting	184 1 0	
(2.) Observatories ...	12 10 5		Incidental and contingent expenses ...	70 13 7	
		13 14 4	Furniture and fittings	12 11 11	
					646 13 6
SPECIAL RESEARCHES:			SPECIAL RESEARCHES:		
Grant for investigation on atmospheric electricity	—	—	Salaries and other charges	—	141 7 10
			LAND METEOROLOGY:		
SUPPLY OF INFORMATION:			Observatories and stations, including remuneration of observers	564 3 2	
Daily Weather Charts and Forecasts ...	89 6 11		Salaries:—Discussion and reduction of observations, &c. ...	359 2 3	
6 p.m. Charts... ...	6 5 0				923 5 5
Reports for Press Agencies, &c. ...	44 13 8		WEATHER INFORMATION AND FORECASTS:		
Telegrams sent abroad	187 2 2		Telegraphic reports and storm warnings, remuneration of observers, &c.	549 8 9	
		327 7 9	Salaries:—Preparation and issue of reports and forecasts ...	472 1 2	
					1,021 9 11
SALE OF INSTRUMENTS, &c.:			OCEAN METEOROLOGY:		
Mercantile Marine account	4 9 2		Salaries:—Discussion and reduction of observations... ...	336 9 11	
"M.O." (Stations) account	28 3 6		Expenses incidental to the supply of instruments:—		
		32 12 8	Proportion for care and issue of instruments	32 10 0	
Repayment of Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	26 9 0	Royal Navy ...	91 19 7	
			Mercantile Marine	24 15 2	
Commission charged on work done for Colonies, &c. ...	—	2 7 6			485 14 8
			Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	40 16 6
SUPERANNUATION ACCOUNT:			SUPERANNUATION:		
Annuity received ...	--	35 12 6	Pensions and allowances...	171 12 6	
			Invested	1,500 0 0	
					1,671 12 6
			BALANCE:		
			Cash at Bank... ...	2,085 14 8	
			„ at Office ...	43 17 10	
					2,129 12 6
		£7,060 12 10			£7,060 12 10

Liabilities.	£ s. d.	Assets.	£ s. d.
To Council	217 10 0	By cash at Bank	2,085 14 8
„ Post Office (partly estimated) ...	315 12 4	„ „ at Office	43 17 10
„ sundry creditors	414 19 10	„ H.M. Exchequer	325 0 0
„ balance	1,775 0 2	„ sundry debtors	268 9 10
	£2,723 2 4		£2,723 2 4

NOTE.—On June 30th the amount of 2½ per cent. Consols held by the Council for the provision of superannuation annuities was £1,576 16*s.* 4*d.*

129. Submitted—The following Statement respecting the Records for July to December, 1899, received from the Self-recording Observatories (*see* Minutes, 21st December, 1868; 20th November, 1876; 3rd January, 1883; and 6th March, 1889).

——	ABERDEEN.		ARMAGH.		FALMOUTH.		FORT WILLIAM.		KEW.		VALENCIA.	
ANEMOGRAPH :—	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity	Direction.	Velocity.
Action of Instrument ...	Good.	Good.	Good.	Good.	Good.	Good.	—	—	Good.	Good.	Good.	Good.
Records deficient :—												
Due to stoppage of clock	0	0	0	0	0	0	—	—	5 hrs.	5 hrs.	0	0
„ other causes ...	5 hrs.	5 hrs.	25 hrs.	38 hrs.	6 hrs.	6 hrs.	—	—	10 hrs.	7 hrs.	2 hrs.	3 hrs.
No. of errors discovered :—												
By general examination	4	1	11	11	11	7	—	—	1	0	4	0
Rslts. of 40 *Remeasmnts.:—*												
Greatest difference ...	1·0	1·0	1·0	1·0	1·0	1·0	—	—	·0	1·0	1·0	1·0
Mn.diff.irrespctv.of sign	·1	·5	·1	·2	·1	·4	—	—	·0	·3	·0	·4
Residual diff. (— M.O.)	— ·1	— ·1	·0	— ·1	·0	— ·2	—	—	·0	— ·1	·0	— ·2
Orientation verified ...	Monthly	—	Occa-sionally	—	Monthly	—	—	—	Monthly	—	Monthly	—

RAIN GAUGE :—						
Action of Instrument ...	Good.	Good.	Good.	Good.	Good.	Good.
Records deficient :—						
Due to stoppage of clock	0	0	0	14 hrs.	0	0
„ other causes ...	3 hrs.	2 hrs.	0	21 hrs.	21 hrs.	5 hrs.
No. of errors discovered :—						
By general examination	1	8	6	16	4	0

——	ABERDEEN.	FALMOUTH.	FORT WILLIAM.	KEW.	VALENCIA.
BAROGRAPH :—					
Action of Instrument ...	Good.	Good.	Good.	Good.	Good.
Character of Photography	Good to Excellent.	Indiff. to Excellent.	Indifferent to Good.	Fair to Good.	Bad to Excellent.
Records deficient :—					
Due to stoppage of clock	0	0	0	0	0
„ failure of light...	0	0	0	2 hrs.	0
„ other causes ...	11 hrs.	2 hrs.	5 hrs.	3 hrs.	3 hrs.
No. of errors discovered :—					
In entry of standards ...	0	3	9	3	0
„ maxima and minima	1	6	14	7	7
„ calculating residuals	0	13	7	0	2
„ applying „	0	9	30	0	4
By general examination	3	27	47	1	40
Rslts. of 40 *Remeasmnts.:—*					
Greatest difference ...	·007	·012	·018	·005	·008
Mn.diff.irrespctv.of sign	·002	·002	·002	·002	·002
Residual diff. (— M.O.)	·000	·000	·000	+ ·001	— ·001
Mean monthly diff. between simultaneous Barograph and Stand. Bar. readings.	·001	·002	·003	·001	·002

THERMOGRAPH :—										
Action of Instrument ...	Good.		Good.		Good.		Good.		Good.	
Character of Photography	Good to Excellent.		Very Good.		Fair.		Good.		Good.	
Records deficient :—	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
Due to stoppage of clock	0	0	0	0	0	0	0	0	0	0
„ failure of light ...	0	0	0	0	0	0	0	0	0	0
„ impfctly.moist.bulbs	—	0	—	2 hrs.	—	14 hrs.	—	0	—	10 hrs.
„ partlly.frozen bulbs	—	67 hrs.	—	0	—	47 hrs.	—	64 hrs.	—	8 hrs.
„ other causes ...	55 hrs.	6 hrs.	4 hrs.	4 hrs.	8 hrs.	6 hrs.	4 hrs.	5 hrs.	4 hrs.	4 hrs.
No. of errors discovered :—										
In entry of standards ...	0	0	2	2	10	11	1	2	0	0
„ maxima and minima	4	—	6	—	10	—	2	—	1	—
By general examination	2	1	11	21	20	34	1	2	10	7
Rslts. of 40 *Remeasmnts.:—*										
Greatest difference ...	·2	·2	·3	·3	·2	·6	·2	·2	·2	·2
Mn.diff.irrespctv.of sign	·1	·1	·1	·1	·1	·1	·1	·1	·1	·1
Residual diff. (— M.O.)	— ·1	·0	·0	·0	·0	·0	·1	— ·1	+ ·1	+ ·1
Mean monthly diff. between simultaneous Thermogph. and Stand. Ther. readings.	·2	·2	·2	·2	·1	·2	·1	·1	·1	·1

ABERDEEN.

The action of the Thermograph light stop caused some loss of trace, and the attachment of the rain papers to the Beckley Gauge at times was indifferent. On the occasion of an unusually high temperature on the 10th October, care had not been taken to secure the record. In other respects the work was satisfactorily carried out.

ARMAGH.

The Velocity traces are faint at low rates, owing to the mechanical defect referred to in previous reports. Bagging was occasionally prevalent in the attachment of the papers to the Beckley Gauge, and the regulation of the clock was unsatisfactory.

FALMOUTH.

The clerical work showed a slight improvement on that of the previous six months, but was hardly up to the usual standard, a remark which applies to the photography also.

FORT WILLIAM.

The regulations of the clock connected with the Beckley Gauge was very faulty, the time lines of some of the curves having to be re-ruled before tabulating ; the attachment of the papers was also indifferent. The aggregate of clerical errors and the "Character of Photography" is set forth in the accompanying table.

KEW.

During September the definition of the Barograph photographic sheets was not good, and on October 3rd the "cylinder was removed and lens and barometer tube, &c., cleaned" and on the 6th the "lens and gas burner was shifted and the gas pipes cleaned out" without satisfactory results. On the 19th, however, "the focus and length of image slightly altered," and the definition very much improved, but in December, attention had again to be drawn to the defect. The work was otherwise generally good.

VALENCIA.

During October there was a falling off in the quality of the photography (Barograms), and the rain papers were not always carefully attached to the cylinder, but in other respects the work was satisfactorily performed.

T. E. ALLEN.

130. Submitted—The following reports of work :—

MARINE BRANCH.

August 8th, 1901.

Examined 13 new logs and one lighthouse register.

For the district southward from the equator, between the West coast of Africa and longitude 90° W., obtaining results of wind and instrumental observations, drawing wind-roses and preparing ocean wind, pressure and temperature charts, coastal chart of South America—proof and revise examined for October, and passed for press.

North Atlantic and Mediterranean Pilot Charts. Ice Reports added to August chart, proofs and revises examined and the sheet passed for press. Proofs of the September chart and letterpress examined. The October chart completed and forwarded to the lithographer. Preparation of information for November and December advanced. Obtaining from Office logs wind and fog results northward of the 50th parallel.

Preparing a skeleton chart of the Indian Ocean district, 30° N. to 30° S., and 30° to 125° E.

Preparing, as specimen, the November Atlantic Sea Temperature Chart for photo-lithography.

Examining proof of observations contained in the meteorological log of the steam yacht "Southern Cross" for December, 1898 to March, 1900.

Notices of Ice not already published forwarded to the *Shipping Gazette* for publication ; also observations of a Comet seen in May last, on board the P. & O. ss. "China," sent to the Royal Astronomical Society.

International Meteorological Co-operation, Correspondence, &c., with respect to the issue of log books for observations from October 1, 1901 to March 31, 1903.

Examination in meteorology of the cadets on board the training ships "Worcester" and "Conway," tabulating results, &c.

Assistance given to the Telegraph Branch in distributing copies of the Daily Weather Reports to the railway bookstalls.

September 16th, 1901.

Examined seven new logs and four lighthouse registers.

For the district south of the Equator, from the west coast of Africa to long. 90° W., drawing wind-roses, and preparing ocean wind charts. Proof of South American coastal wind chart for November examined and sent for revise. Obtaining results of instrumental observations and charting them for drawing isobars and isotherms.

North Atlantic and Mediterranean Pilot Charts—September proofs examined and passed for press. Proofs of October letterpress passed. Preparation of the November and December sheets advanced. Obtaining from Office logs wind and fog results north of the 50th parallel.

Examination and preparation for extraction of data in Office logs for the Indian Ocean region, 30° N. to 30° S. Skeleton chart for winds, &c., drawn.

A sea temperature chart of the North Atlantic prepared for re-production by photo-lithography.

Supplying daily reports of the weather at coast stations for publication in the *Fish Trades Gazette*.

Assistance given to the Telegraph Branch in distributing copies of the Daily Weather Reports to railway bookstalls.

Supplying Messrs. Wendt & Co. with information bearing upon the winds in the neighbourhood of 18° S., 35° W., in March, 1901. (Letter M.O. 1348.)

October 22nd, 1901.

Examined nine new logs.

For the district southward from the Equator, between the west coast of Africa and longitude 90° W., obtaining final results for the various elements, and preparing Ocean wind charts. Revised proofs of the South American coastal wind charts for November and December examined and passed for press.

Proofs and revises of the North Atlantic and Mediterranean Pilot Chart for October examined and passed for press; the charts for November and December completed and sent to the lithographer. Obtaining from Office logs wind and fog results northward of the 50th parallel.

Examination and preparation of information in Office logs for the discussion of the Indian Ocean region from 30° N. to 30° S.

A second Atlantic Sea Temperature Chart prepared for reproduction by photo-lithography.

Supplying Messrs. Wendt & Co. with information bearing upon the winds in the neighbourhood of 18° S., 35° W., in March, 1901. (Letter M.O. 1348.)

CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

CAMPBELL HEPWORTH,
Marine Superintendent.

EXAMINATION BRANCH.

Examinations. August 1st, 1901.

January, 1900.—Completed.

February to June, 1900.—Proceeded with.

April to June, 1901.—Valencia work completed.

Weekly examinations (on receipt) of Curves and Documents from all Observatories.

Reports, &c.

January, 1900.—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.

April to June, 1901.—Copies of "Notes of Errors" to Valencia.

Examinations. September 1st, 1901.

February to June, 1900.—Proceeded with.

July and August, 1901.—Valencia work proceeded with.

Weekly examinations (on receipt) of Curves and Documents from all Observatories.

Reports, &c.

July to December, 1899.—Report on work of all Observatories to Council.

Examinations. October 1st, 1901.

February to June, 1900.—Proceeded with.

July and August, 1901.—Valencia work completed.

January to March, 1901.—Kew work proceeded with.

Weekly examinations (on receipt) of Curves and Documents from all Observatories.

Reports, &c.

September 16th.—Interview with Mr. T. Baker (Kew).

September 18th.—Interview with Mr. J. E. Cullum (Valencia).

Sorting and packing Barograph and Thermograph Journals for all Observatories, 1896–1900.

T. E. ALLEN.

PANTAGRAPH ROOM.

Hourly Means. August 1st, 1901.

Volume for 1898.—The copying of the results for the printer has been completed ; and proof has been passed for press up to page 72.

Volume for 1899.—The calculation of the mean values for this year has been begun.

Mean Temperature Tables for the British Islands.—The copying for press of the results for the four Observatories has been completed, and the form for their publication settled. Diagrams showing the daily march of temperature are in hand. The extension of these tables so as to include all available data covering a period of not less than 15 years, has fully occupied the time of two members of the staff, who would, otherwise, have been engaged upon *Hourly Means.*

Miscellaneous.—Prepared Inspection Notes for Sunshine Stations.
Examined Anemogram forms before issue.
Prepared diagrams and Weather Maps for Annual Report.
Overhauled and cleaned Galton pantagraph.

Enquiry.—Attended Court of King's Bench, *re* Weather in London on January 27th last. (Richards *v.* Randall.)

Hourly Means. September 2nd, 1901.

Volume for 1898.—Proofs have been read and passed for press up to p. 104.

Volume for 1899.—The calculation of the Mean Values for Valencia has been advanced a little.

Mean Temperature Tables for the British Islands.—The extension of these tables to include all available data has been the principal work of the room during the month. Mr. Thompson has been chiefly engaged in drawing curves of mean and extreme temperatures for the four first-class observatories.

Miscellaneous.—Some questions arising from Inspection Notes have been dealt with ; and also the time-scale of the Sun recorder at Haverfordwest.

Hourly Means. October 1st, 1901.

Volume for 1898.—Proofs have been read and passed for press up to page 136.

Volume for 1899—The tables for Valencia are about one-fourth completed.

Mean Temperature Tables for the British Isles.—The form in which these results are to be published has been settled ; and a large amount of work has been done in preparing and copying for press the means received from the Telegraph Room. Many of these means have had to be revised and corrected for the present publication, and search made for the extreme temperatures during the period they cover. Diagrams of Mean and Extreme temperatures for four Observatories have been completed ; and others showing the diurnal range of temperature for each month, for the same stations, are now in hand.

Miscellaneous.—Some time has been occupied upon Inspections.
The Sunshine cards for Bunhill Row, January to June 1901, tabulated for Royal Meterological Society.

R. H. CURTIS.

LAND ROOM.

October 23rd, 1901.

Enquiries during July, August, and September, 1901.

1. Mr. E. Mould.—As to the Rainfall at Hounslow on June 30th, 1901. (M.O. 1056.)

2. Mr. J. M. Mallet.—As to strong winds, &c., in September on the coasts of the Isle of Man. (M.O. 1305.)

3. Mr. W. A. Hawkins.—As to the Rainfall, Temperature, Sunshine and Humidity at various stations on the south and east coasts, and in London during the six months—November, 1899 to May, 1900. (M.O. 1281.)

4. Mr. T. B. Phillips for Rural District Council of Uckfield.—As to the average Rainfall at Waldron, Sussex. (M.O. 1338.)

5. Mrs. F C. Burton.—As to the average Rainfall at Charlbory, Oxon., and at Chipping Sodbury, Glos. (M.O. 1345.)

6. Mr. W. Hamilton.—As to the place in the British Isles that has the warmest and driest climate. (M.O. 1357.)

7. Mr. James Barrett.—As to the exposure of Westgate-on-Sea. (M.O. 1459.)

JOHN A. CURTIS.

In addition to the enquiries referred to above, there were 68 personal enquiries during July to September for forecasts or other weather information, and 81 enquiries by telegraph.

Monthly Return of A. Instruments on Charge.

July, August, and September, 1901.

—	Barometers.	Aneroids.	Thermometers. Ordinary.	Maximum.	Minimum.	Solar Radiation.	Terr. Radiation.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
Dr.													
On charge, July 1st, 1901	40	50	48	52	48	—	—	40	45	2	—	—	
Received during July	25	61	120	11	6	—	—	2	—	—	—	—	
Received during Aug.	28	27	—	2	3	—	—	20	—	—	—	—	
Received during Sept.	10	35	8	—	—	—	—	—	—	—	—	—	
	103	173	176	65	57	—	—	62	45	2	—	—	
Cr.													
Sent out during July	30	34	30	4	—	—	—	2	—	—	—	—	
Sent out during Aug.	24	45	78	16	12	—	—	—	—	—	—	—	
Sent out during Sept.	18	14	22	6	6	—	—	2	—	—	—	—	
	72	93	130	26	18	—	—	4	—	—	—	—	
On charge, Oct. 1st, 1901	31	80	46	39	39	—	—	58	45	2	—	—	

Monthly Return of M.O. Instruments on Charge.

July, August, and September, 1901.

—	Barometers.	Aneroids.	Thermometers. Ordinary.	Maximum.	Minimum.	Solar Radiation.	Terr. Radiation.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
Dr.													
On charge, July 1st, 1901	24	4	77	20	16	2	8	22	86	7	1	8	2 Sunshine Recorders, 7 Spheres.
Received July	7	2	8	—	—	—	—	—	4	—	—	—	1 Sunshine Recorder, 1 Hygrograph.
Received Aug.	9	—	8	—	—	—	—	3	4	—	—	—	1 Sphere, 2 Barographs.
Received Sept.	13	—	37	—	—	—	—	—	—	—	—	—	Instruments for Ant. Ex. 1901.
	53	6	130	20	16	2	8	25	94	7	1	8	
Cr.													
Sent out during July	9	2	28	3	2	—	—	2	10	1	—	—	1 Sunshine Recorder, 3 Spheres.
Sent out during Aug.	13	1	57	—	—	—	—	2	30	1	—	—	1 Barograph.
Sent out during Sept.	5	—	41	3	4	—	2	2	21	1	—	1	Instruments for Ant. Ex. 1901.
	27	3	126	6	6	—	2	6	61	3	—	1	
On charge, Oct. 1st, 1901	26	3	4	14	10	2	6	19	33	4	1	7	2 Sunshine Recorders, 5 Spheres, 1 Hygrograph, 1 Barograph.

15th October, 1901.

R. F. Wallace.

RETURN of ADMIRALTY INSTRUMENTS in the OFFICE and at HIS MAJESTY'S DOCKYARDS, for QUARTER ending June 30th, 1901.

Place and Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office. April 1st, 1901.	Available	75	112	63	50	40	35
	Received, new	—	—	84	6	3	—
	„ repaired, cleaned, &c.	29	15	8	—	—	—
	Total	104	127	155	56	43	35
	Issued	38	64	144	30	27	5
June 30th, 1901.	Total available	66	63	11	26	16	30

COMPARISON of ESTABLISHMENT and STORE.

Depôts.	Barometers.				Thermometers.							
	Mercurial.		Aneroid.		Ordinary.		Max.		Min.		Screens.	
	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.
Meteorological Office	45	66	120	63	250	11	80	26	80	16	50	30
Portsmouth, ...	25	23	55	52	150	131	50	46	50	46	25	16
Devonport „	25	22	55	57	150	161	50	59	50	53	22	21
Chatham „	25	5	55	18	150	60	50	28	50	29	25	6
Sheerness „	6	4	15	15	30	37	10	14	10	14	10	10
Total	81	54	180	142	480	389	160	147	160	142	82	53
Queenstown, ...	2	3	2	8	3	12	3	8	3	8	—	3
Gibraltar „	2	2	2	1	4	9	3	3	3	3	—	—
Malta „	11	11	15	13	60	51	10	13	10	10	1	2
Bombay „	4	4	3	1	10	—	4	3	4	4	1	2
Halifax „	3	4	4	2	20	20	4	1	4	1	1	2
Bermuda „	3	2	4	6	20	5	4	4	4	5	1	2
Jamaica „	3	3	2	4	10	13	2	—	2	1	1	1
Cape of Good Hope „	4	1	6	2	20	12	4	4	4	1	1	2
Trincomalee „	3	3	3	4	10	20	4	5	4	6	1	1
Hong Kong „	12	4	12	9	30	7	12	8	12	10	2	9
Coquimbo „	2	1	4	2	15	18	2	3	2	4	1	1
Sydney „	5	4	6	8	25	17	6	3	6	7	1	—
Esquimalt „	4	3	5	8	15	19	2	2	2	2	1	2
Total	58	45	68	68	242	203	60	57	60	62	12	27

ABSTRACT of FOREGOING COMPARISON.

Date.	Particulars of Surplus (+) and Shortage (−).	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
July 1st, 1901	Meteorological Office ...	+ 21	— 57	— 239	— 54	— 64	— 20
	Dockyards—Home	— 27	— 38	— 91	— 13	— 18	— 29
	„ Abroad ...	— 13	—	— 39	— 3	+ 2	+ 15
	Net shortage	— 19	— 95	— 369	— 70	— 80	— 34

COMPARISON of EXISTING STOCK of INSTRUMENTS AVAILABLE for ISSUE with ESTABLISHMENT.

Date.		Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
July 1st, 1901	Establishment at—						
	Meteorological Office ...	45	120	250	80	80	50
	Dockyards—Home ...	81	180	480	160	160	82
	„ Abroad ...	58	68	242	60	60	12
	Total Establishment ...	184	368	972	300	300	144
	„ short	19	95	369	70	80	34
	Stock available for Issue ...	165	273	603	230	220	110
	„ ordered	20	150	350	75	75	20
	„ repairing	17	—	—	—	—	—
	„ returnable from Depôts	14	11	4	1	3	—
	Total stock	216	434	957	306	298	130

R. F. WALLACE.

131. *Accounts: Audit.*—The Secretary reported that the Accounts for the year ended March 31, 1901, had been audited by the Examiner from the Exchequer and Audit Department on September 25, 1901.

132. Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 3rd July	2,094	3	10
Receipts from 4th July to 22nd October	7,506	18	7
	9,601	2	5
Cheques drawn from 4th July to 22nd October ...	4,143	1	11
Cash balance on 22nd October	£5,458	0	6

133. Submitted—The following list of publications, which had been received since the last meeting :—

Adelaide Observatory.—Rainfall in South Australia and the Northern Territory during 1898, with weather characteristics of each month. By Sir C. Todd.

Allahabad, Meteorological Office.—Administration report of the Meteorological Reporter to Government, North-Western Provinces and Oudh, for the year 1900–1901.

——— ——— Brief sketch of the meteorology of the North-Western Provinces and Oudh, and adjacent parts of Rajputana and the Panjab, for the year 1900.

Baldwin, E. B.—Auroral observations on the second Wellman expedition made in the neighbourhood of Franz Joseph Land.

——— Meteorological observations of the second Wellman expedition.

Bangalore, Mysore Government Meteorological Department.—Report on rainfall registration in Mysore for 1900. By J. Cook.

Barac, M.—Mittheilung über den mit dem Regen in der Nacht vom 10. auf den 11. März 1901, in Fiume gefallenen Staub.

Berlin, Königlich Preussisches Meteorologisches Institut.—Bericht über die Thätigkeit . . . im Jahre 1900 von W. von Bezold.

Black, W. G.—Ocean rainfall by rain-gauge observations at sea. General and special oceans. 1864–75–81.

Bombay, Government Observatory.—Report on the condition and proceedings of the Government Observatory, Colába, for the year which ended with the 31st March, 1901.

Cairo, Public Works Ministry, Survey Department.—A report on the meteorological observations made at the Abbassia Observatory, Cairo, during the years 1898 and 1899, together with the mean values derived from the observations of the previous 30 years, also some magnetic observations.

Calcutta, Meteorological Office, Bengal.—Administration report of the Meteorological Reporter to the Government of Bengal for the year 1900–1901.

——— ——— *India.*—Brief memorandum on the weather in India during the months of June and July, and forecast of the general distribution of the rainfall in India during the months of August and September, 1901.

Cambridge (Mass.), Astronomical Observatory of Harvard College.—Annals. Vol. XXI., part 1 Observations of the New England Meteorological Society in the year 1888.

Cape Town, Department of Agriculture.—Rainfall of South Africa. By D. E. Hutchins.

Carlsruhe, Centralbureau für Meteorologie und Hydrographie.—Deutsches meteorologisches Jahrbuch. Grossherzogthum Baden. Die Ergebnisse der meteorologischen Beobachtungen im Jahre 1900, nebst den Mittelwerthen und Extremen für den fünfjährigen Zeitraum 1896–1900. Zugleich ii. Theil des Jahresb.

——— ——— Jahresbericht . . . mit den Ergebnissen der meteorologischen Beobachtungen und der Wasserstandsaufzeichnungen am Rhein und an seinen grössern Nebenflüssen für das Jahr 1900, und mit den Mittelwerthen für die Zeiträume 1896–1900, 1861–1870, 1871–1880, 1881–1890, 1891–1900.

——— ——— Niederschlagsbeobachtungen der meteorologischen Stationen im Grossherzogthum Baden. 1901, 1. Halb.

Chemnitz, K. Sächsisches Meteorologisches Institut.—Abhandlungen. Heft 6. Die Niederschlags- und Abflussverhältnisse im Gebiet der Weisseritz während der Jahre 1866 bis 1900 und die sich daraus ergebende Einwirkung von Stauanlagen auf die Nutzung des Wassers und die Abflussvorgänge von P. Schreiber.

——— ——— Decaden-Monatsberichte. 1900, Jahrg. 3.

Croydon Microscopical and Natural History Club.—Report of the Meteorological Sub-Committee for 1900.

Davos weather.—Some interesting facts and figures.

Dorpat, Meteorologisches Observatorium.—Meteorologische Beobachtungen angestellt in Jurjew. 31.–35. Jahrg., 1896–1900.

Eastbourne.—Annual report of meteorological observations for the year 1900.

Eaton, H. S.—Returns of rainfall, &c. in Dorset, 1900.

Edinburgh, Registrar General.—Supplement to the monthly and quarterly returns of the births, deaths, and marriages registered in Scotland during the years 1899–1900.

Elster, J.—Messungen der elektrischen Zerstreuung in der freien atmosphärischen Luft an geographisch weit voneinander entfernt liegenden Orten.

Elster, J., und Geitel, H.—Weitere Versuche über die Elektrizitätszerstreuung in abgeschlossenen Luftmengen.

Emden, Naturforschende Gesellschaft.—Jahresbericht. 85. 1899–1900.

Falmouth, Royal Cornwall Polytechnic Society.—Annual report. 68th. 1900.

Figee, S.—Uitkomsten von meteorologische waarnemingen in Nederlandsch-Indië. 1898.

Frankfurt am Main, Physikalischer Verein.—Jahresbericht . . . für das Rechnungsjahr 1899–1900.

Geitel, H.—Ueber die Elektrizitätszerstreuung in abgeschlossenen Luftmengen.

Grossmann, L.—Die Extrem-Temperaturen in Hamburg in den Jahren 1876–1900.

H., P.—The recent lightning storms; some facts concerning the ways of lightning.

Hamburg, Deutsche Seewarte.—Aus dem Archiv der Deutschen Seewarte. 23. Jahrg., 1900.

Hann, J.—Lehrbuch der Meteorologie.

Harmer, F. W.—The influence of the winds upon climate during the pleistocene epoch: a palæo-meteorological explanation of some geological problems.

Hobart, Meteorological Department.—Report for 1899.

Holmfield, Frank.—A day with the clerk of the weather.

Hong-Kong Observatory.—Observations and researches. 1900.

Knipping, E.—Sturmtabellen für den Atlantischen Ozean.

Kodaikánal Observatory.—Report on the Kodaikánal and Madras Observatories for 1900–1901.

Kremsmünster, Sternwarte.—Resultate aus den im Jahre 1900 auf der Sternwarte zu Kremsmünster angestellten meteorologischen Beobachtungen. Von Prof. Thiemo Schwarz.

Lancaster, A.—Contribution à l'étude des situations atmosphériques qui accompagnent le brouillard en Belgique, par E. Vanderlinden. Rapport de M. A. Lancaster, premier commissaire.

——— Les chaleurs exceptionnelles de juillet 1900.

——— La tempête du 13–14 février 1900.

——— Le refroidissement du milieu de mai 1900.

Leyst, E.—Ueber den täglichen Gang des Luftdrucks in Moskau.

London, Admiralty, Hydrographic Department.—Admiralty manual for the deviations of the compass.

——— ——— ——— Africa Pilot, Part 2. 5th edition.

——— ——— ——— The Bay of Bengal Pilot. 3rd edition.

London, Admiralty, Hydrographic Department.—The New Zealand Pilot, including Chatham Islands, the off-lying islands southward of New Zealand, and Kermadec Islands. 7th edition.

——— ——— ——— Tide tables for the British and Irish Ports, for the year 1902; also the times and heights of high water at full and change for the principal places on the Globe.

——— *Board of Trade.*—Abstracts of the returns made to the Board of Trade of shipping casualties . . . from the 1st July, 1899, to the 30th June, 1900 . . . with charts and appendices.

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134. The Eleventh Annual General Meeting of the Meteorological Council was held at 63, Victoria Street, on Wednesday, November 6th, 1901, at the hour of 2h. p.m.

The following Members were present :—

Sir R. STRACHEY, in the Chair.

Mr. Buchan.	Mr. Scott.
Prof. Darwin.	The Hydrographer.
Mr. Dines.	Mr. Shaw (Secretary).

The Secretary read the notice convening the meeting as follows :—

Meteorological Office, 63, Victoria Street, S.W.,
October 24th, 1901.

Sir,

I beg to inform you that the eleventh ordinary general meeting of the Meteorological Council will be held on Wednesday, the 6th proximo, at 2h. p.m., for the receipt of the Report of the proceedings of the Council during the past year, the consideration of the estimates for the year 1902–1903, the appointment of auditors for a year ending 30th June, 1902, and the transaction of other ordinary business.

A draft copy of the Estimates will be sent shortly.

I am, &c.,
(Signed) W. N. Shaw,
Secretary.

The Secretary reported that in accordance with the Articles :—

1. The Report of the proceedings of the Council for the year ended March 31st, 1901, had been submitted to the Royal Society for presentation to Parliament.

2. That the annual estimates for 1901–1902 had been prepared and submitted to the Treasury. That the accounts up to June 30th, 1901, had been examined by two members of the Council, and would be submitted for audit in due course.

3. That ordinary meetings of the Council under the old constitution had been held on the following days :—

1900	...	November	7	1901	...	January	16	1901	...	February	26
,,	...	,,	21	,,	...	,,	30	,,	...	March	12
,,	...	December	5	,,	...	February	12	,,	...	,,	26
,,	...	,,	19								

and ordinary meetings of directors under the new constitution had been held on the following days :—

1901	...	April	24	1901	...	June	4	1901	...	July	3
,,	...	May	8	,,	...	,,	19	,,	...	October	23
,,	...	May	22								

4. That Extraordinary General Meetings under the old Articles of Association had been held on November 21st and December 19th, 1900, for the purpose of revising the Articles of Association in accordance with the proposals of the Royal Society, that the revised Articles had been approved and came into operation from December 20th, 1900, and that an Extraordinary General Meeting under the new Articles of Association had been held on July 3rd, 1901, at which all the newly appointed members of Council were present.

5. That the proceedings of the Council had been regularly recorded and printed during the past year.

The Chairman invited observations upon the Report of the Council submitted to the Royal Society, copies of which had been circulated to members of the Association, but no remarks were made.

Submitted the following memoranda :—

MATERIALS for preparing ESTIMATES for 1902–1903.

	Expenditure 1900–1901.	Estimated Expenditure 1902–1903.	Proposed for 1902–1903.	Voted for 1901–1902.
Administration:	£	£	£	£
(1.) Council, including portion of Secretary's salary	918	875	875	900
(2.) Secretary, less fees as member of Council ...	628	625	625	750
(3.) Salaries:				
Chief Clerk	333			
2 Junior Clerks	295			
Office Keeper	80			
2 Messengers	105			
Caretaker	99			
	912			
Add for increments of salaries, &c.	24			
	936	940	940	920
(4.) Rent, fuel, and lighting:				
Rent	635			
Fuel	60			
Lighting	39			
	734	735	750	700
(5.) Incidental and contingent expenses:				
Office Keeper's contingent account ...	72			
Postage	66			
Carriage of parcels, &c.	16			
Books and Printing	23			
Sundries	69			
	246			
(5*a*.) Furniture and office repairs	125			
(5*b*.) Expenses incidental to International Meteorological Congress	26			
	397			
Deduct repayments under this head, and for commission	40			
	357	360	360	300
Special Researches and Experiments:				
(1.) Salaries:				
1 Junior Clerk	150			
Female Staff (3 in number)	272			
Antarctic work	14			
	436			
Transfer from head *Land Meteorology* ...	250			
(*a*.)	686	670		
(2.) Other charges:				
Anemometers at Holyhead	12			
Sundries	6		870	760
(*b*.)	18			
Miscellaneous researches	100			
	118	200		
Carried forward	—	4,405	4,420	4,330

	Expenditure 1900–1901.	Estimated Expenditure 1902–1903.	Proposed for 1902–1903.	Voted for 1901–1902.
	£	£	£	£
Brought forward	—	4,405	4,420	4,330
Land Meteorology:				
(1.) Observatories and stations:				
Aberdeen (allowance 275*l.*)	284			
Armagh („ 50*l.*)	52			
Ben Nevis („ 100*l.*)	100			
Falmouth („ 250*l.*)	253			
Fort William („ 250*l.*)	248			
Glasgow („ 75*l.*)	77			
National Physical Laboratory (allowance 400*l.*)	404			
Stonyhurst (allowance 56*l.*)	56			
Valencia	485			
Five Anemograph stations and St. Helena ...	80			
Meteorological Societies (Observations 2nd Order, Form A. (details) 7 stations. Form B. (results) 28 stations).	159			
Instruments, forms, &c.	57			
	2,255			
Deduct on account of the termination of the Grant to the Fort William Observatory at end of 1902 ... ... £60				
And receipts for grazing, sale of forms, &c. 26				
	86			
	2,169	2,170	2,170	2,190
(2.) Salaries: Discussion and reduction of observations:				
Observatories:				
1 Senior Clerk	275			
4 Junior Clerks	610			
1 Boy Clerk	44			
	929			
Transfer to head *Special Researches*	250			
(*a.*)	679			
Stations of Second Order, Reports from Foreign Stations and Library:				
1 Senior Clerk	275	1,370	1,370	1,200
2 Junior Clerks	215			
Extra work	1			
(*b.*)	491			
(*a*) + (*b*) = ...	1,170			
Add for increments of salaries, &c.	203			
	1,373			
Weather Information and Forecasts:				
(1.) Telegraphic reports and storm warnings:				
Reports from inland stations ... (Charged in Post Office Account.)	457			
Reports from abroad ... ... (Charged in Post Office Account.)	111			
Reports sent abroad ... ... (Charged in Post Office Account.)	535			
Storm warnings ... ... (Charged in Post Office Account.)	300			
Hay harvest forecasts ... ... (Charged in Post Office Account.)	85			
Private wires ... ... (Charged in Post Office Account.)	37			
Sundry telegrams, forecasts, &c. (Charged in Post Office Account.)	38			
Payments to reporters, &c. (allowances and expenses). (Charged in Post Office Account.)	141			
Do. do. ... ... (Miscellaneous Accounts.)	461			
Postage of reports and forecasts (Miscellaneous Accounts.)	241			
Instruments, &c. ... ... (Miscellaneous Accounts.)	116			
Books, printing, &c. ... ... (Miscellaneous Accounts.)	26			
Weekly Reports ... ... (Miscellaneous Accounts.)	49			
Sundries ... ... (Miscellaneous Accounts.)	30			
	2,627			
Deduct repayments (including £87 for Sale of M.O. instruments)	930			
	1,697	1,695	1,700	1,680
Carried forward	—	9,640	9,660	9,400

	Actual Expenditure 1900–1901.	Estimated Expenditure 1902–1903.	Proposed for 1902–1903.	Voted for 1901–1902.
	£	£	£	£
Brought forward	—	9,640	9,660	9,400
(2.) Salaries:—Preparation and issue of reports and forecasts:—				
1 Senior Clerk (9 hours daily)	309			
7 Junior Clerks (5 work 9 hours daily) ...	1,188			
1 Unclassified Clerk	58			
2 Messengers	130			
Addition for late evening and Sunday attendance, and for extra work	207			
	1,892			
Deduct for change of Staff, &c.	22			
	1,870	1,870	1,870	1,900
Inspections:				
Mr. Buchan, salary and travelling expenses ...	182			
„ Baker, travelling expenses	41			
„ Brodie „	1			
„ Constable „	29			
„ J. A. Curtis „	28			
„ R. H. Curtis „	30			
„ F. Gaster „	17			
„ Shaw „	48			
Royal Meteorological Society, contribution towards cost of their inspections	25			
	401	400	400	450
Ocean Meteorology and supply of Instruments:				
(1.) Salaries:—Discussion and reduction of observations:—				
Marine Superintendent	350			
1 Senior Clerk	275			
5 Junior Clerks	755			
2 Unclassified Clerks	60			
Extra work (Antarctic, &c.)	6			
	1,446			
Deduct proportion chargeable to care and issue of instruments (say) £165				
Add for increments to salaries, &c. ... 35				
	130			
	1,316	1,320	1,320	1,340
(2.) *Care and issue of Instruments:*				
Proportion chargeable for Salaries	—	160	160	130
Instruments, repairs, &c., for the Royal Navy	443			
Deduct repayments under this head	7			
	436	390*	400	500
Instruments, repairs, &c., for the Mercantile Marine	97			
Agents' fees and incidental charges	71			
	168			
Deduct repayments under this head	23			
	145	250*	230	280
Superannuation:				
Mr. Scott	400			
Capt. H. Toynbee	144			
Purchase of Annuity on life of R. Strachan ...	1,463			
Payments to R. Strachan	111			
	2,118	1260†	1260†	1300†
Deduct receipts from N.D. Office	36			
	2,082			
Totals ... ... £	—	15,290	15,300	15,300

* Average of Expenditure of last 5 years.

† Includes reserve of £750.

Synopsis of Office Salaries.

Service.	Proposed for 1902–1903.	Voted for 1901–1902.	1902–1903. Increase.	1902–1903. Decrease.
	£	£	£	£
Administration (not including Council)...	1,565	1,670	—	105
Special Researches	670	660	10	—
Land Meteorology	1,370	1,200	170	—
Weather information	1,870	1,900	—	30
Ocean Meteorology	1,480	1,470	10	—
Totals	6,955	6,900	190	135

Meteorological Office. Estimates for the Year 1902–1903.

Heads of Service.	Proposed for 1902-1903.		Voted for 1901–1902.		1902–1903. Increase.	1902–1903. Decrease.
Administration:	£	£	£	£	£	£
Payment of Council	875	—	900	—	—	—
Secretary (less fees as member of Council)	625	—	750	—	—	—
Salaries and wages	940	—	920	—	—	—
Rent, fuel, and lighting	750	—	700	—	—	—
Incidental and contingent expenses ...	360	—	300	—	—	—
		3,550		3,570	—	20
Special Researches and Experiments:						
Salaries	670	—	660	—	—	—
Other charges	200	—	100	—	—	—
		870		760	110	—
Land Meteorology:						
Observatories and stations	2,170	—	2,190	—	—	—
Salaries: Discussion and reduction of observations	1,370	—	1,200	—	—	—
		3,540		3,390	150	—
Weather Information and Forecasts:						
Telegraphic reports and storm warnings ...	1,700	—	1,680	—	—	—
Salaries: Preparation and issue of reports and forecasts	1,870	—	1,900	—	—	—
		3,570		3,580	—	10
Inspections:						
Salaries and travelling expenses	—	400	—	450	—	50
Ocean Meteorology:						
Salaries: Discussion and reduction of observations	1,320	—	1,340	—	—	—
Expenses incidental to the supply of instruments	790	—	910	—	—	—
		2,110		2,250	—	140
Superannuation	—	1,260	—	1,300	—	40
Totals	—	15,300		15,300	260	260

* This sum included the fees as member of Council.

The estimates were approved, and the Secretary was instructed to forward a copy to the Treasury (P.C. 2537).

Mr. Dines suggested that simpler forms of self-recording barometers and thermometers might be adopted as occasion arose and prove more economical in working than the photographic recorders at the observatories.

The Secretary undertook to consult with Mr. Dines with a view to the matter being brought before the Directors.

Submitted—under Part III. of the Scheme of the Royal Society for the reconstitution of the Council (Minutes p. 58, 1900) the following memorandum showing the manner in which the remuneration of the Directors is proposed to be assigned, in accordance with former practice.

Out of the sum of £1,000 assigned by the Treasury for the remuneration of the Council it is proposed to distribute a sum of £875 as follows :—

£300 to the Chairman.

£50, as a retaining fee, to each of the other Directors, with the exception of the Hydrographer, who holds his appointment *ex-officio*.

The remainder of the sum mentioned (£875), after deducting allowances for travelling expenses to those Directors who are not resident in London, upon the same scale as heretofore, to be divided among the Directors, other than the Chairman, in proportion to their attendances at meetings of Directors or Committees, provided that the total sum paid to any Director shall not exceed £125 in addition to travelling expenses, and provided further that full sum of £125 shall be payable to Mr. Buchan while resident in Scotland, if he attends one-half of the meetings.

Note: The salary of the Secretary who is also a Director is made up to £750 annually, including any sum he may receive as a Director.

The proposals were adopted and the Secretary was instructed to forward a copy to the Royal Society for approval.

The meeting then adjourned.

63, *Victoria Street, November* 6, 1901.

At a meeting of Directors held after the General Meeting—

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	THE HYDROGRAPHER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

135. The Minutes of the last meeting (October 23rd) were read and confirmed.

136. *London Fog Inquiry* (Minute 106).—It was agreed to invite Captain Alfred Carpenter, R.N., D.S.O., a member of the Council of the Royal Meteorological Society, to undertake the arrangements for collecting suitable observations and other information from the stations of the Metropolitan Fire Brigade and other stations, either within or outside the London District and collating them with general meteorological conditions upon the following general terms :—

(1) The work to be under the direction of the Meteorological Council.

(2) A room in the Office to be assigned for the purposes of the inquiry and special clerical assistance to be provided if necessary at a cost not exceeding £2 per week.

(3) The Secretary to make arrangements with Captain Carpenter as to the programme of the inquiry.

(4) The remuneration to be offered to be £20 per month in addition to the repayment of the necessary expenses in connexion with visits to the stations.

(5) The arrangement to be from month to month.

137. *Lloyd's—Offer of Observations at Gibraltar* (Minute 81).—The Secretary reported the receipt of a letter dated 2nd July, 1901, from Lloyd's stating that they would be pleased to give instructions for observations to be taken at their signal station at Gibraltar if the Council would supply the necessary instruments.

It was agreed to arrange for observations of wind, temperature and rainfall, and to lend thermometers and a rain gauge, and to send instructions for making a screen.

138. *Royal Meteorological Society—Experiments with Kites.*—Read—the following letter (M.O. 1,675) :—

M.O. 1,675.

Royal Meteorological Society,
Princes Mansions,
70, Victoria Street, S.W.,
31st October, 1901.

DEAR SIR,

I AM requested by the Council of this Society to apply to the Meteorological Council for a grant in aid of "an investigation of the upper atmosphere by means of kites," which has been undertaken by the Society. Application was made to the British Association at their last meeting, when a committee was appointed, with Mr. W. N. Shaw as chairman, and our president, Mr. Dines as secretary, to co-operate with this Society in initiating the investigation, and a grant of £75 was made for the purpose. This Committee is now co-operating with the Society's Committee, and the Council of this Society have given a grant of £25. The estimated cost of the experiments for the first year is at least £250, and this includes instruments, kites, winch, steam engine, and house, or the hire of a steam launch as may eventually be thought desirable. Mr. Dines has very kindly offered to devote three months next summer to making the observations.

Trusting that the Meteorological Council will consider this application favourably, and will be able to help the Society to raise the sum required.

I am, &c.,
FRANCIS CAMPBELL-BAYARD,
Secretary.

W. N. Shaw, Esq., F.R.S.,
Secretary,
Meteorological Office.

The consideration of the matter was deferred to the next meeting.

LICS 139. *Northumberland County Council.*—At the request of the Technical Education Committee (M.O. 1,666) of the Northumberland County Council it was agreed to have the returns of observations at Cockle Park, Morpeth, for 1899 and 1900 prepared immediately for publication as overtime work at the usual rates, the extra cost, estimated at £1, to be charged to the Committee.

140. *Oxford—Loan of Barometer* (Minute 35).—Read—letter (M.O. 1,688) from Mr. Rambaut asking that the Council should send a Kew assistant to make a special comparison of the repaired barometer with a Kew Standard.

The Secretary was directed to reply that the Council would give the instructions to the National Physical Laboratory if Mr. Rambaut would bear the expense of the comparison (P.C. 2453).

141. *Stonyhurst—Hour of Observation for Second Order Returns.*—Read—letter (M.O. 1,601) requesting to be allowed to adopt 8 p.m. for the evening observations and correct the maximum and minimum, as well as the current temperature to 9 p.m. by the curves of the thermograph.

The Secretary was instructed to reply that the Council would prefer 9 p.m. as the hour of observation but would accept 8 p.m. if the later hour were specially inconvenient for the Observatory (P.C. 2459).

142. *Publications* (O. 90).—The Secretary reported the receipt of 100 copies of O. 90 from Mauritius in reply to the request of the Council (Minute 5 of March 12th, 1901).

143. *International Antarctic Co-operation.*—Reported—a request from the Marine Superintendent for about three hundred additional copies of the Register of Observations at sea at Greenwich Noon in connexion with the Antarctic Expeditions.

The Hydrographer reported that 25 copies were available at the Admiralty. The reprinting of 300 additional copies was approved.

144. *Suggested shortened form of Log* (Minute 125).—The suggestion of a shortened form of log for Atlantic and other voyages was referred to the Hydrographer.

145. Read—A memorandum from the Marine Superintendent stating that since the last meeting three logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

146. *Storm Warnings.*—Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the Coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on three days, the total number of districts warned being 17. In two districts the warnings were justified by subsequent gales (force 8 and upwards), and in six districts by strong winds (forces 6 and 7). In nine districts they were not required.

GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

None.

Forecasting Branch,
6th November, 1901.

147. *Reports of Work* :—

MARINE BRANCH.

November 5th, 1901.

Examined five new logs and two lighthouse registers.

Discussion of the data collected for the region southward from the Equator, between the west coast of Africa and longitude 90° W. Grouping wind and instrumental results in 5° squares; drawing isobars and ocean wind-roses; and charting barometer and air and sea temperature means. To the engraved South American coastal wind chart for December adding isobars and notes on local features of wind and weather.

North Atlantic and Mediterranean Pilot Chart for November passed for press; December sent to the lithographer; January and February in preparation; and obtaining from Office logs wind and fog results northward of the 50th parallel. The Variation Curves for 1905 drawn and sent to the lithographer for reproduction, to be shown on all Pilot Charts from January, 1902. Correspondence with steamship owners to secure an increased number of observers for sea temperature and ice reports.

Examination, preparation and extraction of data in Office logs for the Indian Ocean district between 30° N. and 30° S.

Obtaining for Messrs. Sir W. G. Armstrong & Co., Ltd., information relating to weather and ice in the North Atlantic between August 29th and September 21st, 1901.

CHAS. HARDING.

The Marine Superindent.

Forwarded for the information of the Council.

CAMPBELL HEPWORTH,
Marine Superintendent.

PANTAGRAPH ROOM.

November 1st, 1901.

Hourly Means.—Volume for 1898. Proofs have been passed for press up to page 184. There are now 56 pages required from the printer to complete the volume.

Volume for 1899. Very little has been done upon the tables for this volume during the month.

Mean Temperature Tables for the British Isles.—The staff has been chiefly occupied during the month in completing the tables for this work. The data received from the Telegraph Branch are completed for press. The data from the Land Branch are being dealt with, but they involve a large amount of work to prepare them for press. Curves showing the diurnal range of temperature for four Observatories have been drawn, and with the diagrams of mean and extreme temperature for the same places have been sent to the printer. Twenty-six pages of proof of this work have been passed for press.

Miscellaneous.—A good deal of time has been taken up in storing early curves and documents in the loft.

Enquiry.—As to velocity equivalents for the numbers of Beaufort's Scale; for Mersey Docks and Harbour Board.

R. H. CURTIS.

LAND ROOM.

November 6th, 1901.

Enquiries during October, 1901.

1. Mr. G. Moatagnon.—As to the daily rainfall in Middlesex and Essex during 1900.

2. Messrs. Walkers, Parker, & Co.—As to the prevalence of westerly and south-westerly winds at Bagillt, Flintshire. Also as to the number of rainy days and the proportion of wet days with westerly and south-westerly winds. (M.O. 1,548.)

3. Mr. R. J. Angel.—As to the hours of sunshine and of rain in London in the six months, April to September, 1900 and 1901. (M.O. 1,612.)

4. Mr. Henry King.—As to the maximum temperature in the sun observed in the N.E. of England during the last few years. (M.O. 1,598.)

JOHN A. CURTIS.

In addition to the enquiries referred to above there were 12 personal enquiries during October for forecasts or other weather information and 12 enquiries by telegraph.

148. *Audit.*—Reported—That the cash accounts for the quarter ended the 30th June last had been this day examined by Prof. Darwin and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st April last, when there was a balance of £3,122 9*s.* 1*d.*, were £3,938 3*s.* 9*d.* against £3,907 6*s.* 9*d.* in the corresponding period of the preceding financial year. The payments were £4,931 0*s.* 4*d.* against £3,616 13*s.* 4*d.* during the same period in the previous year. The balance in hand and at the bank on the 30th June, 1901, amounted to £2,129 12*s.* 6*d.*, and at the same date in 1900 to £3,993 5*s.* 4*d.*

149. *Accounts.*—Submitted—The following Statement of Accounts for the six months ending 30th September, 1901 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1900–1	—	3,122 9 1	Administration :		
Parliamentary vote ...	—	7,000 0 0	Secretary	300 0 0	
Repayment of expenses charged under—			Salaries and wages ...	458 14 0	
(1.) Incidental expenses	10 15 9		Rent, fuel, and lighting	363 12 10	
(2.) Observatories ...	15 14 11		Incidental and contingent expenses ...	116 8 4	
		26 10 8	Furniture and fittings	14 3 7	
Supply of Information :					1,252 18 9
Daily Weather Charts and Forecasts ...	148 14 4		Special Researches :		
6 p.m. Charts ...	12 10 0		Salaries and other charges	—	250 12 7
Reports for Press Agencies, &c. ...	106 12 9		Land Meteorology :		
Telegrams sent abroad	199 10 2		Observatories and stations, including remuneration of observers	1,038 8 6	
		467 7 3	Salaries :— Discussion and reduction of observations, &c. ...	716 13 3	
Sale of Instruments, &c. :					1,755 1 9
Mercantile Marine account	6 9 0		Weather Information and Forecasts :		
"M.O." (Stations) account	43 1 6		Telegraphic reports and storm warnings, remuneration of observers, &c.	1,106 2 1	
		49 10 6	Salaries :—Preparation and issue of reports and forecasts ...	947 0 11	
Repayment of Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	178 7 3	Inspections :		2,053 3 0
			Salaries and travelling expenses	—	66 15 10
Commission charged on work done for Colonies, &c. ...	—	8 6 6	Ocean Meteorology :		
			Salaries : —Discussion and reduction of observations... ...	669 16 11	
Superannuation Account :			Expenses incidental to the supply of instruments :—		
Annuities	70 18 9		Proportion for care and issue of instruments	65 0 0	
Interest on Investment	9 5 8		Royal Navy ...	204 3 4	
		80 4 5	Mercantile Marine	41 9 6	
			Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	980 9 9
					330 0 3
			Superannuation Account :		
			Pensions and allowances	342 18 9	
			Invested	1,500 0 0	
					1,842 18 9
			Balance :		
			Cash at Bank	2,319 8 11	
			„ at Office ...	44 6 1	
			Advances for Travelling Expenses ...	37 0 0	
					2,400 15 0
		£10,932 15 8			£10,932 15 8

Liabilities.	£ s. d.	Assets.	£ s. d.
To sundry creditors	1,412 13 1	By cash at Bank and at Office ...	2,363 15 0
„ balance	2,161 2 1	„ H.M. Exchequer	650 0 0
		„ sundry debtors	560 0 2
	£3,573 15 2		£3,573 15 2

Note.—On September 30th the amount of 2½ per cent. Consols held by the Council for the provision of Superannuation Annuities was £1,576 16*s.* 4*d.*

150. Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 22nd October	5,458	0	6
Receipts from 23rd October to 5th November...	39	13	8
	5,497	14	2
Cheques drawn from 23rd Oct. to 5th Nov. ...	975	5	10
Cash balance on 5th November...	£4,522	8	4

151. Submitted—The following list of publications which had been received since the last meeting :—

Bell, Arthur H.—Animals as weather prophets.

—— —— The mechanism of a sunset.

Bremen, Meteorologische Station I. Ordnung.—Deutsches meteorologisches Jahrbuch für 1900. Freie Hansestadt Bremen. Herausgegben von P. Bergholz. Jahrg. 11.

Calcutta, Meteorological Office, India.—Rainfall of India. 9th and 10th years. 1899, 1900. 2 vols.

—— —— —— Report on the administration of the Meteorological Department of the Government of India in 1900-1901.

Colombo, Surveyor General's Office.—Report on the meteorology of Ceylon for 1900.

Dublin, General Register Office.—Detailed annual report of the Registrar-General (Ireland), containing a general abstract of the numbers of marriages, births, and deaths registered in Ireland. 37th. 1900.

Hamburg, Deutsche Seewarte.—III. Nachtrag zum Katalog der Bibliothek der Deutschen Seewarte zu Hamburg.

London, Admiralty, Hydrographic Department.—North Sea Pilot. Part 4. The eastern shores of the North Sea, from Cape Gris Nez to the Skaw. 6th ed.

—— *British Association for the Advancement of Science.*—Hints to meteorological observers in tropical Africa, with instructions for taking observations. Prepared by a Committee of the British Association for the advancement of Science, 1891.

Margate.—Annual report on the meteorology of Margate by the Borough Meteorologist for the year 1900.

Ottawa, Department of Marine and Fisheries.—Report of the Meteorological Service of Canada, by R. F. Stupart. 1898.

—— *Geological Survey of Canada.*—Annual report. New series. Vol. II., 1898, with vol. of maps. 2 vols.

Polis, P. et Sieberg, A.—L' observatoire météorologique d' Aix-la-Chapelle.

Rotch, A. L.—A new field for kites in meteorology.

Sieberg, A.—Mittheilungen über am meteorologischen Observatorium zu Aachen beobachtete Sonnenringe.

—— Temperaturumkehrungen mit der Höhe zwischen Aachen und Aussichtsturm im Aachener Stadtwalde.

Strassburg, International Kommission für wissenschaftliche Luftschiffahrt.—Beobachtungen und Ergebnisse der Auffahrten mit bemannten und unbemannten Ballons am 8. November, 1900. X. internationale Fahrt.

63, *Victoria Street, S.W., November* 20, 1901.

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.

PROFESSOR DARWIN. | THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

152. The Minutes of the last meeting (November 6) and of the Ordinary General Meeting of the same date were read and confirmed.

153. *London Fog Inquiry* (Minutes 106, 136).—The Secretary reported that Captain Carpenter had undertaken the work in accordance with the terms of Minute 136 (M.O. 1,800, P.C. 2,536), and that he had commenced work in Room 14 of the Office.

The Secretary further reported that he had engaged Mr. W. D. Matthews for temporary employment as additional clerk in connexion with the fog inquiry at a salary of £2 per week from November 11th.

Approved.

It was resolved that the cost of printing any supplementary forms supplied at the discretion of the Secretary for the fire brigade stations in addition to the general forms prepared for the inquiry (Circular No. 55) be charged against the County Council grant.

It was resolved that application be made to the Admiralty for observations to be made and returned on Form No. 55, together with observations of the dry and wet bulb and sea temperature thermometers, to be supplied from the Office, at the following Coast-guard Stations:—Gravesend, Cliffe Creek, Haven Hole, Shoeburyness, Sheerness. (P.C. 2,569.)

154. *Royal Meteorological Society—Experiments with Kites* (Minute 138).—It was agreed to return a reply to the Society to the effect that the Council regarded the proposed inquiry as one for which application might appropriately be made to the Government Grant Committee of the Royal Society; that it was contrary to the practice of the Council to make grants of money to individuals or bodies undertaking scientific researches except for the purpose of obtaining observations which could be incorporated with the work of the Office, but that they were prepared to consider a proposal for making provision for a suitable station to be used as a base station at the place selected for the experiments, upon the understanding that copies of the observations would be sent to the Office in due course.

The Secretary was instructed to draft the reply in consultation with the Chairman.

155. *Northern Lighthouse Board—Additional Storm Signal Stations.*—Read—letter (M.O. 1,777) from the Northern Lighthouse Board asking whether the Council would be prepared to send storm warning telegrams to fourteen additional stations in Scotland if the Board supplied the cones and gear.

The Secretary suggested that opportunity should be taken to secure the exhibition of signals, if possible, after dark.

The Hydrographer was requested to report upon the matter.

156. *Publications—Daily Weather Report.*—Read—letter (M.O. 1,791) from Dr. Polis of the Aachen Observatory asking for a free copy of the Daily Weather Report.

The Secretary was directed to report upon the practice of the Office in regard to such applications.

157. *Instruments—Tests of Aneroids.*—Submitted—the subjoined form of certificate and conditions of test proposed by the National Physical Laboratory (M.O. 1,797) in place of those arranged in accordance with Minutes 1894–5, pp. 82, 83, and 93.

THE NATIONAL PHYSICAL LABORATORY,

Kew Observatory, Richmond, Surrey.

CERTIFICATE OF EXAMINATION.

ANEROID BAROMETER No. _____

by _____

has been compared with the Standard Instruments of the National Physical Laboratory, with the following results:—

TABLE OF CORRECTIONS.

Pressure, Inches.	Corrections to the nearest 0·01 inch.	Pressure, Inches.	Corrections to the nearest 0·01 inch.
31		28	
30		27	
29		26	

(1) When the sign is + the correction should be added, when − substracted.

(2) Sum of the *differences* of the errors with pressure diminishing and increasing at the five points of observation from 30 to 26 inches = 0· inch.

(3) Correction at atmospheric pressure immediately after experiment = 0· inch.
" " " 24 hours " " = 0· inch.

(4) Difference between readings in horizontal and vertical positions = 0·0 inch.

(5) Excess of readings at extreme temperatures : 35° less 60° = 0·0 inch.
95° less 60° = 0·0 inch.

(6) The results in the Table of Corrections from 30 to 26 inches were all obtained with the pressure diminishing—after the aneroid had been for several days under the ordinary atmospheric pressure—the instrument being set to read correctly at 30 inches.

(7) The differences between the readings with pressure diminishing and increasing are for a 4½-inch aneroid.

(8) When pressure continues very low, or rises rapidly after having been much reduced, an aneroid tends to give too slow a reading of pressure. This error is likely to be larger the greater the difference shown in (2) between the errors with pressure diminishing and increasing. After return to ordinary atmospheric pressure, the aneroid gradually recovers more or less completely. The recovery is slower the more gradual the previous lowering and raising of pressure, and in ordinary use it will seldom be as rapid as that shown in (3).

All results except those under (4) *refer to the suspended position.*

The National Physical Laboratory,
_____ 190 *Director.*

PROPOSED NEW CONDITIONS OF TEST.

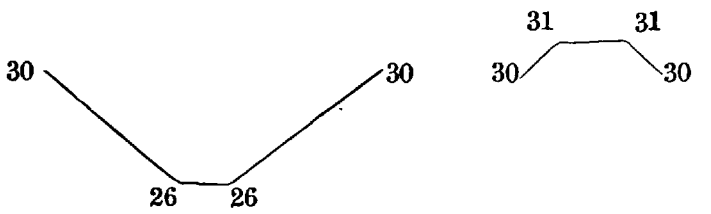
M.O. 4½-INCH ANEROIDS, 31-26 INCHES.

In place of tests approved by Council, February 6th, 1895.

Temperature Test.—Test at 35°, 60°, and 95° F. in suspended position, at atmospheric pressure. Reject if the difference of the readings at any two of these temperatures exceeds 0·05 inch.

Position Test.—Test with aneroid horizontal and suspended, at atmospheric pressure. Reject if the two readings differ by more than 0·05 inch.

Test for Scale Errors.—Test at every inch from 31 to 26 inches, with pressure diminishing from 30 to 26 inches, and with pressure rising from 30 to 31 inches, according to the scheme



Allow an interval of at least 24 hours between the two parts of the test, pressure being altered at the rate of an inch in five minutes. Reject if the error at any point in the first part of the test differs from that at 30 inches by more than 0·04 inch, or if in any one inch there appears an error of more than 0·03 inch.

Test for Return ("*creep*" *or* "*after effect*").—In the first test, with pressure altering, after keeping the pressure at 26 inches for 5 minutes, allow it to rise to 30 inches at the rate of one inch in 5 minutes. Reject if the sum of the differences of the errors at 30, 29, 28, 27, and 26 inches, with pressure diminishing and increasing, exceeds 0·14 inch.

The form and conditions were approved.

It was agreed that the order for aneroids (Minute 99) now partially executed should be completed under the old conditions of testing.

158. *Scilly—Removal of Lloyd's Signal Station by the War Office* (M.O. 680).—The Secretary reported that he had called upon Lieut.-Col. Kenney, R.E., C.M.G., Commanding Officer R.E., Exeter, on October 5, 1901, with reference to the suggested removal of Lloyd's Signal Station. It transpired that the projected action of the War Office would involve the removal of all the apparatus at Scilly belonging to the Council, because (1) they desired the removal of the tower used by Lloyd's for their station, and (2) the premises would shortly be enclosed in an unclimable fence and no person would be admitted within it who was not in the Service.

The R.E. could not take over the work of the station and the care of the anemometers because their occupation ceased as soon as the works were completed and handed over to the charge of the R.A.

Col. Kenney saw no difficulty about the work being taken over by the Garrison Artillery if work of that kind was undertaken by the Coastguard. To raise that question application must be made to the General Commanding the Western District, Devonport. There would always be a N.C.O. who could take the duty and he would be sufficiently long at the station for the arrangement to be satisfactory. The question of 7 a.m. observations would raise no difficulty.

Apart from any arrangement with the War Office Col. Kenney suggested that Lloyd's station might be established on a high ridge near the Garrison at St. Mary's which accommodated several disused wind mills. The highest point is some seventy feet higher than the present site of the tower.

159. *Marine Observations aboard Foreign Ships.*—Read—letter (M.O. 1,759) from Messrs. Wilson and Gillie, Bruce and Sons, Limited, the Agents for the Office at Cardiff, offering observations from Captain Wielen, of the Russian Fin Steamer "Hermes," if supplied with the usual instruments, and offering to guarantee the return of the instrument and records at the end of the voyage or when relinquished by the Captain.

The Secretary was directed to ascertain what voyages the ship would make and report.

160.—Read—A memorandum from the Marine Superintendent stating that since the last meeting four logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

161. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on 6 days, the total number of districts warned being 32. In 21 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 6 districts by strong winds (forces 6 and 7). In 5 districts they were not required.

GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

162.—Submitted :—

MONTHLY RETURN OF INSTRUMENTS ON CHARGE.

1*st November*, 1901.

——	Barometers.	Aneroids.	Thermometers. Ordinary.	Maximum.	Minimum.	Solar Radiation.	Terr. Radiation.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
"A." ACCOUNT.													
Dr.													
On charge, 1st Oct. ...	31	80	46	39	39	—	—	58	45	2	—	—	
Received since ...	24	44	153	95	87	—	—	3	—	—	—	—	
	55	124	199	134	126	—	—	61	45	2	—	—	
Cr.													
Sent out during month	40	52	73	26	23	—	—	6	4	—	—	—	
On charge, 1st Nov. ...	15	72	126	108	103	—	—	55	41	2	—	—	
"M.O." ACCOUNT.													
Dr.													
On Charge, 1st Oct. ...	26	3	4	14	10	2	6	19	33	4	1	7	2 Sunshine Recorders. 5 Spheres. 1 Hygrograph. 1 Barograph.
Received since ...	6	—	103	—	—	—	—	—	—	—	—	—	
	32	3	107	14	10	2	6	19	33	4	1	7	
Cr.													
Sent out during month	5	—	37	2	2	—	—	1	15	1	—	7	
On Charge 1st Nov. ...	27	3	70	12	8	2	6	18	18	3	1	—	2 Sunshine Recorders. 5 Spheres. 1 Hygrograph. 1 Barograph.

19th November, 1901.

R. F. WALLACE.

163.—*Report of Inspections* :—

REPORT OF INSPECTIONS OF STATIONS IN CONNEXION WITH THE OFFICE—1901.

The telegraphic reporting stations, a number of climatological stations, and the self-recording instruments at the observatories and other stations, have been inspected during the summer. Dr. Buchan undertook the Scottish Stations, Captain Hepworth those in the North of Ireland and the North-West of England, Mr. Gaster those in the South-East of England, Mr. R. H. Curtis parts of Wales and Ireland and the North-West of England, Mr. J. A. Curtis the North-Eastern District, and Mr. Brodie part of the South-Western District, while I took charge of the inspection of the stations in the South of Ireland and the South-Western District of England.

The self-recording instruments at the various stations, except Holyhead, Scilly, Alnwick Castle, and North Shields, have been inspected by Mr. T. W. Baker and Mr. E. G. Constable, of Kew Observatory, who have also, in some cases, inspected the telegraphic reporting instruments or climatological instruments at the stations they have visited.

The climatological stations in connexion with the Royal Meteorological Society have been inspected by Mr. Marriott.

In presenting the notes of the inspections I have thought it best, as last year, to group them according to the classification of the stations. The notes on the telegraphic-reporting stations are given first, then those of climatological stations, distinguishing between normal climatological stations (stations of the second order of the international classification) and other stations, which furnish data of a less complete character. The notes about the self-recording instruments at the observatories and other stations follow.

W. N. SHAW.

NOTES BY THE INSPECTORS.

TELEGRAPHIC REPORTING STATIONS.

ENGLAND AND WALES.

Bath, September 6th.—I visited this station for the purpose of comparing the barometer with my standard and of personally inspecting the arrangements for the observations upon which the daily telegram is sent. In Dr. Symon's absence Mr. Craven showed me the station. Everything is well arranged and in excellent order. It is unfortunate that the high building in course of erection to the west of the dome threatens the early morning sun for a certain period of the year, otherwise the exposure of all the instruments is admirable.

W. N. S.

Dungeness, September 21st.—The regular reporter, Mr. Taylor, was away, but Mr. Smith was in attendance. The grass near the rain gauge was rather too long, but all else was in very good condition, and Mr. Smith could read accurately and quickly. I inquired into a few discrepancies recently noticed, and gave necessary instruction. The reporting barometer (618) is certainly a little too low, and the check (619) is worse.

F. G.

Holyhead, September 14th.—I still think the position of the rain gauge at this station is very unsatisfactory, the willows surrounding the hollow in which it is placed being eight to ten feet high. The observer told me he did not think the gauge would be interfered with if placed on the lawn, and I selected a site for it there to which the observer will remove it if instructed to do so. Since the last inspection a deputy observer has been instructed—Mr. Weekes. He appeared to me to be well fitted for the work, and read the barometer and made up a report satisfactorily.

For report on anemometers see pages 88, 89.

R. H. C.

Jersey (*St. Aubin's and St. Heliers*), September 27th.—The instruments were all clean and in good order, but the dry bulb and spare thermometers each read about one degree too high. I recommended that a new dry bulb thermometer should be supplied. Some instructions were given respecting the extra remarks in the telegrams, those supplied at present being too long, and often very confused. Inquiries were made as to the omission on some recent occasions of the amount of sunshine from the daily report, and arrangements were devised for insuring unbroken regularity in this respect in future.

F. J. B.

Liverpool (*Bidston Observatory*), September 5th.—The arrangements for the meteorological observations at this observatory are excellent, and everything appeared to be perfectly satisfactory. No change had been made in the arrangement of the instruments since they were last inspected.

R. H. C.

Loughborough, September 4th.—Everything was in good order at this station, except that the thermometer screen was loose in the ground. I gave instructions for four oaken stakes to be inserted to steady it. Mr. Berridge is most careful and accurate.

J. A. C.

Newton Reigny, July 30th.—This station was inspected by the Secretary last year; no changes have occurred since then in the position, or adjustment of the instruments. With the exception of the rain gauge measuring glass, all were clean and in perfect order.

C. H.

Oxford, August 26th and 27th.—For report see page 86.

Pembroke (*St. Ann's Head*), September 3rd.—The thermometer screen is worn out and should be replaced by a new one. The opportunity might be used to change the position of the screen and rain gauge to one some 150 yards due south of the present one and, by that much, nearer the observers who live in the lower light house. The sunshine recorder could not so easily be removed. For such work as fixing the screen in a new position a handy man from Dale would be employed, an estimate being obtained. The man is by trade a mason, but he undertakes any odd jobs. Mr. Dunsford will watch the wet bulb coating carefully; it was dry at the time of my visit, and there had been no

greater difference than 1° between the dry and wet for some weeks. A difference of 5° or more was exhibited upon my moistening the wet bulb in the fresh breeze of easterly wind. He will also level the rain gauge. The second observer, Mr. Jackson, has been at the lighthouse since Christmas, we took some readings of the barometer and thermometer together. A new thermometer is required to replace B.T. No. 1,308, which is not clearly graduated and has nearly all the figures on the porcelain scale obliterated. A spare thermometer is also required. The observations are taken at 8 a.m., 12 noon, and 6 p.m. At this station 2 p.m. observations are not made. The lantern for use in the night observations is found to blow out on windy nights and a lantern that is not subject to that drawback is desired by the observers. The office property wants painting. The sunshine recorder seemed to have been very well adjusted though the lens was not on this occasion very vigorous. The card was not quite set to the noon mark.

W. N. S.

Portland Bill, September 30th.—Everything at this station was in satisfactory order, and the chief observer, Mr. Charles Smith, seemed careful and intelligent. The observations are taken on alternate days by Mr. Smith and by the assistant light-keeper, Mr. S. Carpenter, who is quite competent. This appears a satisfactory arrangement, as it keeps each observer in good practice. A heavy dew had occurred on the night preceding my visit, and I found quite 0·01 inch of water in the rain gauge which had not been measured and reported to the office. I impressed upon each observer the importance of examining the gauge *daily*, even in dry weather.

F. J. B.

North Shields, September 17th.—The instruments were all in good order, and the observer, Mr. Clark, carries out his duties with much care and attention. The thermometer screen needed repainting, and I gave directions for this to be done.

For report on anemograph see page 89.

J. A. C.

Spurn Head, September 18th.—I found the instruments in good order at this station. The screen, however, is not over grass, for it is impossible to get ordinary turf to live amid the loose sand of which the Head is composed. The observer read his barometer ·009 inch too high, but I gave the required instruction on this and some other points. He seems very anxious to do his work well.

J. A. C.

Yarmouth.—The instruments were in good order, but the recording barograph was reading 0·25 inch too high, this was put right.

For report on anemograph see page 89.

E. G. C.

SCOTLAND.

Aberdeen, August 7th.—Mr. Boswell was unfortunately on holiday, and Mr. Joseph Scott, recently appointed assistant, was on duty. Mr. S. shewed himself to be a remarkably good observer, was familiar with the instruments, and made the observations with expertness and accuracy. All the instruments were in excellent order.

For report on self-recording instruments see page 87.

A. B.

Leith, September 7th.—The gate of the enclosure for the thermometers and rain gauge stands much in need of renewal which was ordered to be done. Otherwise everything was in excellent order and the observations were made carefully and with much intelligence.

A. B.

Nairn, August 17th.—A new minimum thermometer was received on August 30th, 1900, which appears to be a good instrument. The new maximum thermometer is not a good one. The old one, which is not engraved on the stem, is used meantime till another is sent. Otherwise the instruments were in very good order, and Miss Penny shewed much intelligence and skill in making the observations.

A. B.

Sumburgh Head (*Dunrossness*), August 8th and 9th.—The thermometer screen is much out of order, and a new one should be sent at once. The stand is strong and good but requires repainting. The degrees are not etched on the stem of the maximum thermometer, the minimum thermometer is half a degree too low, and the dry and wet bulbs are each half a degree too high. A complete set of thermometers is required for this important station. The instruments are well kept and observed. More attention is promised to be given in adding to the daily telegrams the more important changes recorded by the barograph.

A. B.

Wick, August 13th.—As the screw of the vernier of the reporting barometer got loose, the check barometer was sometime ago made the reporting barometer. The thermometer box had just been painted, and on my arrival the muslin of the wet bulb was being changed. The instruments were in good order, and the observations continue to be made with care. Mr. Sinclair still continues to assist with the observations.

A. B.

IRELAND.

Blacksod Point, July 19th.—I found the instruments here in good order and condition, but the holder of the sea surface thermometer leaked slightly; it was, however, to be repaired at once. The observer, Mr. Marshall, Chief Officer of Coast Guard, appears to take considerable interest in the work. During his absence the observations are now taken by the Senior Commissioned Boatman instead of by the Chief Boatman as formerly.

C. H.

Donaghadee, July 25th.—With the exception of the rain gauge, which is somewhat the worse for wear, although still reliable, the instruments were in perfect order here. Mr. Aggar, who is new to the work, is a careful and intelligent observer; his assistant, Mr. Curtis, is accustomed to it and is quite proficient. Both understand the necessity for absolute accuracy in their reports. The rain gauge was not well situated, being near a healthy crop of potatoes; it was soon removed however to a more suitable position and I left it firmly fixed and level.

C. H.

Malin Head, July 23rd.—The new observer, Mr. Cox, a smart, intelligent man, seems to take pleasure in the work. All of the instruments were in first-rate order and perfectly clean. The rain gauge was not well fixed, the upper surface of a large stone, used as a prop for it, came within 3 or 4 inches of its rim. I left it level, firm, and in working order. This station appears to be a suitable one for an anemometer, and it would be in competent hands. Near the flag staff is a watch house belonging to the Admiralty, in use for a few weeks only during the year. This little building would make an excellent anemometer house.

C. H.

Parsonstown, August 26th.—Mr. Colvin is leaving at the end of next week. Arrangements have been made for Mr. Roe's brother to take his place. While the brother is learning Mr. Roe will take the telegraphic observations.

For report on other instruments see page 83.

W. N. S.

Roche's Point, August 29th.—The War Office shed, referred to in last year's report, has been removed and an enclosure about 22 ft. × 13 ft. has been erected, of wooden paling, for the rain gauge and screen, close to the lifeboat house on the North Shore of the promontory of Roche's Point. The paling is not very securely fixed between the corner posts, but otherwise the arrangement for exposure is now satisfactory. The new screen has been placed with the opening to the north as directed. I gave instructions for the paling to be properly fixed and painted white. Mr. Kennedy intends to resign his appointment in the telegraph office from March next, and it will be necessary to make fresh arrangements for the observations at this station.

W. N. S.

Valencia, August 28th.—Some steps should be taken as to the dry and wet thermometers which have high corrections, and the sunshine recorder wants slight readjustment, otherwise the station is properly equipped and is quite efficient.

For report on self-recording instruments see page 83.

W. N. S.

CLIMATOLOGICAL STATIONS.

NORMAL CLIMATOLOGICAL STATIONS *—(Second Order Stations of the International Classification.)

ENGLAND AND WALES.

Ampleforth, September 10th.—The thermometer screen and the rain gauge have been placed in new positions since the last inspection. The exposure is still good, though that of the thermometers would be improved by raising the screen. This it was promised should be done. The instruments were all in good order, and the observer, Rev. J. B. McLaughlin, O.S.B., takes much interest in the work. I was informed that meteorological observations of some kind have been taken here for a long series of years.

J. A. C.

Aspatria, July 31st.—The position of this station is greatly in its favour and it promises to become a valuable one. Mr. Smith Hill is keenly interested in the work, and anxious to comply to the letter with all the requirements of the office. The thermometer screen is not well situated, being too near trees and shrubs; Mr. Hill has, however, decided to remove it to a more suitable position suggested by me. There is an excellent site for an anemometer on the tower. The sunshine recorder was not quite level, and it wobbled slightly. I left it perfectly level, and firm; Mr. Hill will have it cemented in position. It is situated on a tower, and has an exceptionally good exposure. A plan of the station has already been sent to the office by the observer.

C. H.

* A normal climatological station is one at which readings are taken each day at 9 a.m. and at 9 p.m. local time, and which is provided with the following instruments, properly verified and exposed:—Barometer, dry-bulb, wet-bulb, maximum and minimum thermometers, and rain-gauge.

Buxton, July 29th.—The muslin on the wet-bulb thermometer was too thick and required changing. I recommended a re-arrangement of the thermometers in the screen in order to get better light on the scales of the dry and wet. The posts of the thermometer screen were rotten and required renewing. The screen also needed painting. The observer's measurement of snow was unsatisfactory. I urged him always to melt and measure what was actually in the gauge. The barometer seemed to be in good adjustment, but I recommended that it be removed to Mr. Pilkington's house. The sunshine recorder had been tampered with on the day of my visit. The index hand for latitude had been broken off, so I adjusted the instrument by my altazimuth to 53°. Trees on the south-west and west subtend an angle of 10°. The observations seemed to be taken under difficulties, as the observer lives a considerable distance from the instruments.

W. M.

Canterbury, November 14th.—This is in many respects a very desirable station. The observer is sanguine and ingenious. The barometer is very good, and agreed exactly with the standard. The screen is a Stevenson—home-made. The thermometers are not the conventional pattern, and the maximum and minimum are only a "Six" thermometer, the grass thermometer is a cheap instrument; but all agreed with standard very well. The anemometer and photographic sunshine recorder are, both of them, of private design and construction, but appear to work well. There were too many trees about, but these are being cut down. With some encouragement to the observer, I think this may develop into a very good second-order and weekly-weather-report station.

F. G.

Cheltenham, August 12th.—This station is at the Modern School at Prestbury Road. The country is level to the foot of the Cotswold Hills, about two miles to the east. On comparing the thermometers it was found that the wet-bulb had gone up 0°·1 and the maximum 0°·3. I recommended that the position of the maximum and minimum thermometers in the screen be altered, in order to give a better view of the scales of the dry and wet. The rim of the funnel of the rain-gauge needed re-soldering.

W. M.

Chester, September 6th.—The returns from this station are very much in arrear, which the observer attributes to pressure of other duties. He suggested the possibility of the observations being taken over by the Corporation, in which case arrangements could no doubt be made for ensuring their being kept up to date.

R. H. C.

Churchstoke, July 12th.—This station is at Mellington Hall, nearly midway between Montgomery and Bishop's Castle. On comparing the thermometers, it was found that the dry, wet, and minimum had all gone up 0°·2. The grass minimum had 0°·9 of spirit up the tube. The sunshine recorder is placed on the leaden roof of the staircase at the top of the tower. The observer says that he believes the lead becomes heated by the sun, and so throws the recorder out of level. The frame was not level, the eastern side being 2½° lower than the western side. I packed it up level with cardboard. There was no sunshine at the time of my visit.

W. M.

Cockle Park, Morpeth, September 13th.—Mr. Hogg, the former observer had left Cockle Park, and the observations were being taken by Mr. Bell, the farm manager, pending the appointment of Mr. Hogg's successor. There was rather more than a degree of separated spirit in the grass minimum thermometer. With this exception, everything was in very good order. The exposure of the instruments is excellent, and the observations are taken with much care and intelligence.

J. A. C.

Cronkbourne, July 27th.—Everything was most satisfactory at this station, and efficiency is ensured by the unfailing interest taken by Mr. Moore and his two assistants in the work.

C. H.

Fulbeck, September 5th.—The instruments were all in good order. Mr. Willson's setting of the barometer agreed with mine, but Miss Watts, who sometimes acts as deputy observer, set and read the instrument a little too high. Mr. Willson expressed his satisfaction that the observations are now included in the weekly weather report. He continues to take much interest in the work.

J. A. C.

Llandudno, July 26th.—The instruments are placed on a grass plot at the corner of the garden adjoining the Royal Hotel. I recommended that ivy be permitted to grow on the wall, in order to check any possible reflected heat. The thermometer screen required strengthening to prevent vibration of the thermometers. I removed the barometer from the porch at Warwick House to the Council Offices, the height of the cistern being 92 ft. 8 ins. above sea-level. The sunshine recorder is to be mounted on a new iron column.

W. M.

Llandudno, September 9th. As a question had recently arisen as to the position of the instruments here, I made a rough plan of the enclosure in which they are placed.

R. H. C.

Rousdon, August 28th.—This station was in good order. On comparing the thermometers it was found that the dry-bulb and the 1 ft. earth thermometer had both gone up 0°·1. It is the intention of Lady Peek to continue the second order observations.

W. M.

St. Davids, September 4th.—Dr. Propert's station is continued in the same satisfactory way as heretofore. I set the rain gauge level, being set in soft ground, it had become lower on the west side by a small amount. I was somewhat apprehensive of interference by the trees and shrubs to the south-east of the gauge; but I was assured by Dr. Propert that there had been no practical encroachment, since the readings of the gauge were found to agree with those of a gauge in the open field. The grass minimum thermometer, according to my readings, gave a result 0°·7 too low at 58°. It is an instrument with a divided bulb, but there was no apparent reason for the large correction.

W. N. S.

Scarborough, July 30th.—The muslin and cotton on the wet-bulb thermometer were dry at the time of my visit. I instructed the observer to use better muslin and cotton. The sunshine recorder was not quite level. I called on the Borough Surveyor, and also on Dr. Hudson, the Chairman of the Meteorological Sub-committee, and asked them to arrange for a thermometer screen to be put up in some other part of the town, in order to ascertain what difference exists between it and the present site. There is no doubt that the slope to the west of the present site becomes much heated by the afternoon sun, and so raises the evening temperatures.

For report on sunshine recorder see page 92.

W. M.

Sheffield, Weston Park, September 7th.—This is an excellent station, well supplied with instruments, and very well managed by Mr. Howarth, F.R.A.S., the Curator of the Museum. The grass minimum was too high above the grass. I requested it might be lowered, and slightly changed in position. This it was promised should be done. With this exception, everything was in very good order, and much care is taken with the work. The past records are remarkably well kept.

For report on sunshine recorder see page 92.

J. A. C.

Stokesay, September 23rd.—Mr. La Touche was from home, but I saw Miss Tonkin, who is the actual observer, and who showed much interest in the details of the work. The observations appear to be carefully made, and the instruments were all in good order. Special attention was given, as desired, to the comparison of the barometer with my standard.

R. H. C.

Stonyhurst, September 25th and 26th.—The various thermometers, &c., were all fonnd to be in good order, and the observations are carefully made.

For report on self-recording instruments see page 86.

T. W. B.

Wessington Court, October 4th.—All the instruments were in excellent order, but the thermometer screen is not of the recognised pattern. It is far too shallow, and the interior air must be unduly heated, especially in the summer time. I suggested that a sunshine recorder would be a desirable addition to the equipment of the station. Miss Grafton had already thought of this, and promised to give the matter further consideration.

F. J. B.

Whitchurch, August 19th.—This station is on the edge of Whitchurch Moor, 2½ miles south-east of Tavistock and 5½ miles west by south from Princetown. The instruments are placed in a kitchen garden. The station was in good order.

W. M.

Woolacombe, August 16th.—The instruments are placed in the grounds facing the Woolacombe Hotel. The exposure is very good. Hills extend from north-west, through north and east, to south, broken only by a valley to the east. The place is open to the sea from south to north-west. On comparing the thermometers it was found that the dry bulb and wet bulb had both gone up 0°·1. The barometer was not quite vertical, as the wall on which the board was fastened had settled somewhat. The funnel of the rain-gauge required re-soldering. I recommended that wooden buttons be put under the minimum thermometer to prevent vibration in windy weather. The sunshine recorder was in good order.

W. M.

York, September 6th.—The thermometer screen badly needed re-painting. This it was promised should be done at once. It had also a crack in the roof through which rain reached the instruments, but this I had repaired at the time. The rain-gauge also was a little faulty, the pipe leading from the funnel to the collector having been broken off. I asked that this should be replaced. All the other instruments were in good order. I requested that the daily sunshine amounts might be entered on the monthly sheets.

For report on sunshine recorder see page 92.

J. A. C.

SCOTLAND.

Ben Nevis Observatory, August 21st and 23rd.—The instruments at Fort William were read correctly by the superintendent and the two assistants present, and the observations at the top have been made uninterruptedly. The station at the top was inspected by Mr. Andrew Watt, M.A., chief assistant in the office in Edinburgh, who went carefully into details as I had arranged, and he reported that, "Generally speaking the work of the Observatory was in a very satisfactory state, that clerical work was up to date, and that there is an excellent and very neat compilation of mean values of all sorts from the opening of the Observatory to the present time." The instruments were all separately read by Mr. Watt and the three observers present, with satisfactory results. The barometers continued to be in good order; the very slight oxidation on the surface of the cistern in no way interfering with the correctness of the readings. A Stevenson screen will be sent to replace the old one, and an additional set of dry and wet bulbs are also to be sent. Several photographs of the Observatory and the instruments in position were taken.

A. B.

Cargen, August 26th.—A new rain gauge was added in the spring of 1900. The instruments were all found to be in good order, and the observations are very carefully made.

A. B.

Dundee, August 6th.—The chief observer, Mr. Carnochan, was absent on holiday, and Mr. W. Shephard, who is a particularly good observer, was in charge. The thermometer screen had been newly painted, and all the instruments were in excellent order.

A. B.

Dunrobin, August 14th.—The instruments were in excellent order, and the observations are made with intelligence and regularity.

A. B.

Fort Augustus, August 19th.—The instruments were in excellent order and the observations made with much intelligence and fulness, particularly the observation of clouds. A snow gauge and a Hicks' self-registering rain gauge have recently been added to the instruments.

A. B.

Fort William, August 21st and 23rd.—Part of the spirit of the minimum thermometer on grass was lodged near top of the tube, which was rectified by the observer. As a new house has been built interfering with the continuous record of the sunshine recorder, the position has been changed to a place higher up the grounds of the Observatory, where at all seasons the record will not be interfered with. Otherwise the instruments were in excellent order and well observed.

For report on self-recording instruments see page 87.

A. B.

Glasgow, October 10th.—The instruments were all in excellent condition, and the observations are made with great fulness and accuracy. Professor Becker gives much attention to the observations of temperature and rainfall.

For report on self-recording instruments see page 87.

A. B.

Glenlee, August 29th.—Everything is well attended to, and the observations are well observed.

A. B.

Lairg, August 15th.—The instruments were all in very good order, and Mr. and Mrs. Macrae give much attention to secure punctuality and accuracy in the observations. There is a new maximum thermometer, which replaces the old one that had been broken.

A. B.

Laudale, August 22nd.—The thermometer screen now shows signs of decay, and a new one is desirable, otherwise the instruments are in excellent order. For carefulness and correctness Mr. Fletcher's observations take a high place.

A. B.

Ochtertyre, October 3rd.—The instruments continue to be kept admirably, and the observations are accurately and intelligently made.

A. B.

Pinmore, August 30th.—Mr. Donald, the old observer, died since last inspection. Mr. R. Torrance, who has recently been appointed gardener, had all the instruments in good order. He received some instruction as to the reading of the barometer, but all the other instruments he read quite correctly.

A. B.

Strathpeffer, August 16th.—A new rain-gauge has been added, and both rain-gauges will continue to be read for some time. Dr. Fox will continue to use all efforts to reduce gaps and late readings in the monthly sheets sent to the office. The instruments are kept in excellent order, and the observations are made with quite exceptional intelligence.

A. B.

IRELAND.

Armagh, September 27th and 28th.—Here I found that all the instruments were in excellent order. The corrections to the dry and wet thermometers have not been changed for many years past. I would suggest that Dr. Dreyer be asked to apply a correction of — 0°·4 to both the dry and wet thermometers.

For report on other instruments see page 90.

T. W. B.

Belfast, July 26th.—All was well here, and I was fortunate in being accompanied by Professor Morton as well as by Mr. Wylie and the observer, Mr. Robinson, during my round of inspection. The anemometer is situated on a tower. It is a Robinson, and one of the earliest patterns—quite a curiosity. Professor Morton is of opinion that during light winds the *direction* recorded by it is not reliable. There appears to be an excellent position on this tower for a sunshine recorder, and I had some conversation with Professor Morton and Mr. Wylie upon this subject.

C. H.

Dublin, August 24th.—Barometer only inspected. Sir J. Moore was away, and I left word that if he wanted any further inspection he was to write to the Office.

W. N. S.

Dublin, September 17th.—At the request of Sir John W. Moore I made a further comparison of his barometer with my standard, the result confirming the correction which had previously been obtained.

R. H. C.

Phœnix Park, September 17th.—The exposure and condition of the instruments at this station leaves nothing to be desired, and they were very accurately read by the observer, Corporal Blackmore, who appears to take considerable interest in his work. A lightning conductor on the anemometer stand, which at certain seasons interfered for a few minutes with the sunshine record, has been removed to the northern side of the stand, where it is out of the way. The wooden fastenings for the recorder had become decayed, and in consequence the base is liable to be moved. I pointed this out to Captain Rotherham, R.E., who promised to have it made secure.

R. H. C.

For report on anemograph see page 90.

Glasnevin (Botanic Gardens), September 16th.—The observer here—Mr. Pope—has apparently been accustomed to set the vernier of the barometer too low, and I think his readings have probably all been ·01 inch too low in consequence. When the error was pointed out to him he set the vernier quite correctly, and read it accurately. The position of the instruments is excellent, and with the exception of the grass thermometer, the jacket of which was broken, they were all in good order, and the observations appear to be carefully made.

R. H. C.

Markree Castle, July 21st.—Most of the instruments were in good order, and all are well cared for by Mr. Henkel. The rain gauge was not firmly fixed, and owing to the nature of the soil there appears to be some difficulty in making it permanently rigid, but Mr. Henkel will endeavour to do so by means as yet untried. I have asked Mr. Henkel to have the sunshine recorder cemented down while level and in position. It was brought quite level (after being carefully adjusted) by means of wooden quoins made on the spot, no other means being available.

C. H.

Parsonstown, August 26th.—No special remarks. The difference of correction between the wet bulb and dry bulb thermometers should be attended to. It makes a serious difference in the computation of humidities. The corrections — 0°·3 and — 0°·1 are used now according to my notes, but this matter should be seen to.

W. N. S.

For report on other instruments see page 79.

OTHER CLIMATOLOGICAL STATIONS.

ENGLAND AND WALES.

Alnwick Castle, September 12th.—The wet-bulb was improperly mounted. Otherwise the instruments were in good order. The thermometer screen however (which had been painted stone colour) was now almost black, and it had bare earth beneath it. I requested that it might be painted white, and that turf should be laid down under it. This it was promised should be done. I tested the Fortin Barometer in the Castle against my standard with which it agreed within ·002 inch.

For report on anemometer see page 88.

J. A. C.

Arlington Court, October 8th.—The observations here are taken, under Lady Bruce Chichester's superintendence, by the head gardener, Mr. Thomas Grant. He had not been long at the station, and was new to meteorological work, but seemed careful and intelligent. The rain-gauge measure had been broken about five weeks prior to my visit, and the new one supplied was an eight inch glass,

which had been used in connexion with a five inch gauge. Observer was instructed to report the matter at once to Lady Chichester (who was away from home at the time), and in the meantime to make the best use he could of the stump of the old measure, which held rather more than 0·1 inch of water. The daily amounts for the interval have since been corrected on our returns, and a list of the revised values has been sent to the observer.

F. J. B.

Bethesda (*Penryhn Quarries*), September 9th.—This station had not previously been visited. The gauge was badly placed close to a high wall, but it was at once removed to a more open site, where the exposure is fairly good. The record of rain is most carefully kept, and Mr. H. P. Meares, Manager of the Quarries, will be glad to receive any suggestions for getting reliable rainfall statistics for the district, and especially for the Ogwen Valley.

R. H. C.

Caistor, September 19th.—This is a new rainfall station, situate at the Manor Fishery. The position of the gauge is good, but the instrument itself is unsatisfactory. It is a 5 inch bottle gauge, and it is impossible to ensure that the rim shall remain level. The glass measure supplied with the instrument differed from that I had with me as standard by amounts varying from ·005 inch to ·030 inch. Mr. Ford, who is the proprietor of the Fishery, takes much interest in the work and makes an efficient observer. It is to be regretted his rain-gauge is not a better one.

J. A. C.

Cirencester, October 2nd.—The instruments were generally in good condition, but the minimum thermometer had about 6° of spirit detached from the main column. The instrument was set right, and the observer instructed how to remedy such defects in future. The thermometer screen is an old one of a very small pattern, and might well be replaced by one of more modern construction. The adjustment of the sunshine recorder was not perfect, but was so nearly right that it seemed inadvisable to interfere with the instrument.

F. J. B.

Colly Weston, September 5th. The instruments were all in good order, but the thermometer screen was not firmly fixed. This, it was promised, should be corrected at once. The observer, Miss A. Tasker, was from home on the day of my visit, but the deputy observers appeared to take much interest in the work. The readings of the dry-bulb and wet-bulb have not hitherto been recorded, but I asked that this might be done in future.

J. A. C.

Cullompton, August 24th.—This station was in good order. On comparing the thermometers it was found that the wet-bulb had gone up 0·°1. The sunshine recorder was in good order. The trees on the West, and West-north-west may possibly intercept a little of the late evening sunshine.

W. M.

Hawarden Bridge, September 6th.—This was the first inspection of this station. The rainfall returns are from a gauge which registers on a dial the amount of rain, and for more than one reason I do not think it a very satisfactory instrument. The position of the gauge is also unsatisfactory, and if it could be moved to the field below the steep bank on which it now stands it would be better. Unfortunately Mr. Summers had just left the works, and I was not able to get so much information respecting the observations as I desired.

R. H. C.

Hereford (*Belmont*), July 11th.—This station is at S. Michael's Priory, 2½ miles South-west of Hereford. The instruments were in good order. The grass minimum thermometer had some spirit up the tube. I gave the observer instructions as to the measurement of snow.

W. M.

Hull, September 19th.—I called at the Pearson Park, and saw the Superintendent, Mr. E. A. Peak, F. R. Met. Soc. I found a complete outfit of instruments, including a Stokes sunshine recorder, and earth thermometers. The exposure of the thermometer screen is satisfactory, but the solar maximum and the grass minimum were placed together at six inches above the ground. The sunshine recorder was on a level with the ground. A better exposure for this instrument could easily be found, though the trees in the park will always to some extent shelter it. I found that observations had been regularly taken since 1867, and I was assured that, on application, the Parks Committee would readily agree to send copies of the observations to the office, and probably the sunshine cards also if desired. The readings are taken at 9 a.m. and 9 p.m., and are published *in extenso* by the Corporation.

J. A. C.

Littlestone-on-Sea, September 20th.—As was to be expected, the station being in abeyance, I found the thermometers and rain gauge in an utterly neglected condition, they had not been touched for several months. The solar maximum and the terrestial radiation thermometers were both broken, and the wet-bulb mounting had not been touched for six or eight months. The rain gauge was full of water, and the observer (a new one) had never been trained at all. I put the dry, wet, maximum and minimum thermometers and rain gauge in order, instructed observer as well as I could by 5½ hours' work, and hope matters may improve. The barometer and sunshine recorder were in good order, and observer can read them both accurately. Returns will re-commence in October.

F. G.

Llandovery, October 5th.—New maximum and minimum thermometers were procured through the office, and set up last December. The instruments were in good order, but the grass under the thermometer screen was covered with a thick growth of strawberry runners. Observer promised that this should be at once removed. There is a good Fortin barometer, by Negretti, at this station, and a set of dry and wet bulb thermometers, but the latter are not mounted in the screen.

F. J. B.

Mareham-le-Fen, September 28th.—This is a new rainfall station. The gauge is 5 inches in diameter, by Negretti and Zambra, and it is placed on the lawn in a fairly large garden adjoining the house and the road. In its present position it is sheltered to some extent by the hedges and trees, but I was unable to find a better site in any of the places shown to me as being available for the purpose. The observer, Mrs. G. L. Kime, desires to set up a thermometer screen, and I promised that directions for making one should be sent to her. I selected a suitable position for the screen when made.

J. A. C.

Newcastle-on-Tyne, September 14th.—I found everything in very good order at this station, where the observations are conducted with great care by Mr. Robinson, the assistant in charge. There is however, no improvement as regards the evening and Sunday observations, nor is any improvement possible under present conditions. I spoke to Mr. Martin about the likelihood of the City taking up the observations and he agreed it would be well to communicate with the authorities on the subject.

For report on sunshine recorder see page 91.

J. A. C.

Rauceby, September 6th.—This is a rainfall station, where observations have been recorded for many years past, but which has only recently sent returns to the office. The gauge was fixed over bare earth. I asked that it might be removed to a more open position about nine yards away, and that turf might be laid down around it. This it was promised should be done. At the request of Rev. Vere F. Willson of Fulbeck (through whom the observations reach us), I endeavoured to find a suitable position for a sunshine recorder) but the grounds are so well wooded that I failed to find any spot free from objection. Mr. Hope, the gardener, is a careful and intelligent man, and will, I think, make a good observer.

J. A. C.

Rochford, near Tenbury, October 3rd.—This station supplies only rainfall observations and a tracing, weekly, from a Richard aneroidograph. The rain gauge is well exposed, and appears to be carefully looked after by the observer, who takes a considerable amount of interest in the subject generally. The self-registering aneroid was compared with my standard, and adjusted to the proper level.

F. J. B.

Shaftesbury, August 29th.—The muslin on the wet-bulb thermometer required changing. The conducting thread, also, was too short. The mercury in the maximum thermometer appeared to have a tendency to run up the tube, and so to give too high a reading. I suggested that another maximum thermometer be placed in the screen, and the two read together. I recommended that a larger bottle be placed in the rain gauge cylinder.

W. M.

Sheffield, West Street, September 9th.—This is a station in the centre of the City, where a very complete outfit of excellent instruments has been fitted upon the roof of the Central Radical Club. These instruments are the property of Mr. Barker, who is a most careful and enthusiastic observer, and who contributes a weekly statement of results to the local press, a copy of which is regularly sent to the office. The roof is spacious, and the exposure of the instruments is, for such a position, exceedingly satisfactory, and the results will in my opinion well represent the conditions of that part of Sheffield.

J. A. C.

SCOTLAND.

None.

IRELAND.

Ballyglass, July 19th.—I inspected a fishery barometer which has been here since November, 1879, and which looked almost new. A new sea surface thermometer was required at this station to replace one in an unsatisfactory condition.

C. H.

Crosshaven, August 30th.—The barometer is in excellent order, and is reading accurately within ·01 inch. The vernier is a French one, following the mark. The book of instructions is quite clean, and more or less unused, dating from 1883. The instructions are for English type verniers. The instrument is used by yachtsmen. There are no fishermen to use it, the only fishing boats being shrimpers.

W. N. S.

Elly Bay, July 19th.—I visited the coast guard station at Elly Bay, where there is a fishery barometer, and found the instrument well cared for.

C. H.

Valencia, Glanleam, August 28th.—Miss Fitzgerald's rain gauge is at Glanleam, and is in charge of Lady Fitzgerald's housemaid, who has been instructed by Miss Fitzgerald. The gauge is now fixed in the carriage drive and is not level, but the housemaid will arrange with the gardener to get it put right.

W. N. S.

Killarney, August 28th, 1901.—The instruments are on a site selected by Archdeacon Wynne, the rain gauge about 20 yards and the screen about 30 yards from the projecting central portion of the south front of the asylum, a long range of buildings, the highest or central part being about 40 feet to the eaves, surmounted by two gables; the wings are somewhat further away and lower. The rain gauge is a few feet from the gravel path in front of the building, on grass ornamented with shrubs and low trees. From the front the ground slopes away to the level of the lake below, and forms part of a generally hilly and wooded country. The screen is not of the standard pattern, and has a solid bottom. The exposure is somewhat restricted by the building on the north and by the trees. The instruments are good and well attended to.

W. N. S.

Kingstown, July 17th.—I found the barometer, which is in Dr. Power's house, and the thermometer, and rain gauge situated in the Park, all in good order and condition. Dr. Power hopes before long to be in a position to record 9 p.m. observations. The sunshine recorder is on the roof of the municipal buildings. It was out of adjustment for concentricity, and for level East and West. I adjusted the instrument. A full size "Robinson" anemometer on the east pier appeared in working order and looked as though it had been well cared for in the past. Mr. Foote, Harbour Constable, has had charge of it since it was placed there in 1886. He appears to be a reliable and intelligent man.

For further report on anemograph see page 90.
For further report on sunshine recorder see page 92.

C. H.

Knightstown, August 28th.—The fishery barometer is well cared for. The diagram is not exhibited to the public, but made up from time to time in the coast guard station.

W. N. S.

Stations with Self-recording Instruments.

A.—Observatories (First Order Stations of the International Classification).

Falmouth, October 7th–9th.—As usual at this observatory the photography was very good, and all the instruments working satisfactorily.

On dismounting the anemometer I found the sperm oil in the bearings in a satisfactory condition, all parts, however, were cleaned, and fresh sperm oil applied.

The recording apparatus and clock received due attention, after which the orientation was tested and found correct.

Both the barograph and thermograph clocks were cleaned and the lenses and condensers carefully wiped. In the case of the barograph clock a new line was attached to the weight. The zero dots of the thermograph were shifted from the summer to the winter position.

The self-recording rain gauge was in good order. It was generally cleaned, the clock oiled, and "squeezes" were taken of its funnel as well as that of the spare gauge.

A new pen and a small bottle of ink were supplied to Mr. Kitto.

T. W. B.

Oxford, Radcliffe Observatory, August 26th–27th.—The self-recording meteorological instruments were in their usual first-class order, and all the curves, both photographic and otherwise, were very good.

The usual cleaning and examination was gone through, but there was nothing calling for special remark. The weather at the time of my visit was not favourable for out-door inspection, but I managed, with the assistance of the staff, to take down and clean the anemometer. The sperm oil for direction-rollers had a slight deposit, but was otherwise fairly clean and fluid. It was removed and fresh sperm used.

The orientation was examined and found satisfactory. A new pen and a supply of ink was furnished for the Beckley gauges.

E. G. C.

Stonyhurst, September 25th–26th.—At this Observatory all the instruments were working satisfactorily and the photography was good. The anemometer was first examined and found to be well lubricated in all parts.

The oil in the direction well was rather dirty but quite fluid; this was cleaned out and all bearings replenished with the sperm oil recently supplied by the Meteorological Office.

The cups and arms were quite sound but the direction fans are wearing away and one of the blades is badly corroded. New fans are much needed.

The orientation was examined and found correct.

Due attention was given to the barograph and thermograph, the lenses and condensers were carefully wiped and the position of the thermograph dots was shifted from the summer to the winter position. It was noticed that the aperture in the wet bulb shield, through which the light from the zero dot passes, was scarcely deep enough, and in consequence some of the rays were cut off, but this I had rectified before starting the instrument again.

The rain gauge was working well, and rubbings of both the self-recording and spare gauge funnels were taken and are sent in with this report.

For report on other instruments see page 81.

T. W. B.

SCOTLAND.

Aberdeen, August 3rd–6th.—The self-recording instruments at this Observatory were, on the whole, in very good order. The barograph and thermograph clocks were cleaned, &c., and lenses and mirrors polished.

The crutch of the thermograph clock was rusted ; this was removed and the beat improved.

The escape pallets are beginning to wear.

The Robinson anemograph was thoroughly overhauled and cleaned.

The oil in the direction-well, although fluid, was rather dirty, and had "caked" on the rollers. These were soaked in paraffin and well cleaned, and new sperm added.

The cup-arms had rusted—they were rubbed down and painted.

The " back-leash " in the worm on the direction fan-spindle is becoming rather marked.

The clock, pencils, &c., were also cleaned, and the orientation tested and found satisfactory.

The Beckley rain-gauge was cleaned and all left in good order.

" Squeezes " were taken of both rain-gauges.

For report on other instruments see page 78.

E. G. C.

Fort William, August 13th and 14th.—The barograph and thermograph at this station appeared to be performing satisfactorily, but the clock escapements required attention.

They were taken down and cleaned. The spindle on the light shutter cam of the barograph had rusted a little ; this was put right, and the clock beat, which was very faint, was improved.

The minute divisions on the dial of the barograph are very indistinct.

I slightly lengthened the time-interval of the light-stop on the thermograph so as to widen the gap on the photographic curves and allow for full development of the traces. The lenses and mirrors were carefully polished. It was noticed on the 14th that the thermograph light-shutter lever grazed the side of the box at times, and stopped the clock, so the cover was shifted and a wedge fitted, and it is now acting well.

The 14th was showery, but I managed to clean the Beckley rain-gauge, lock, examine lifter, &c., fit new pen, and leave all in good order.

A measuring glass is wanted here for the check gauge.

For report on other instruments see page 82.

E. G. C.

Glasgow, August 16–19th.—There has been no change in any of the instruments since my visit in 1899, but a new brass supporting-tube has been fitted to the thermograph frame.

The thermograph clock required attention ; it was taken down and well cleaned and oiled.

The nut holding down the spur-wheel on the light shutter arm had worked loose ; this was put right.

The barograph clock was cleaned, and I took down the temperature bar, as the knife edge was slightly rusty and the bearing dirty. This removal may, perhaps, slightly affect the value of the residual correction to the tabulated readings.

The barometer-tube had become rather cloudy, so the diaphragm was removed and tube well cleaned.

The mirrors and lenses received the usual attention.

The Robinson anemograph was thoroughly overhauled.

The sperm oil in the direction-roller well, although very discoloured, had not thickened much, but there was a perceptible sediment. It was removed, and fresh sperm, sent by the Office, used.

The exterior parts were in good order, with the exception of the fan-blades on the direction spindle. I arranged with Dr. Becker to have these rubbed down and painted.

The clock escapement, pencils, &c., were cleaned, and the driving arbor geared in closer with the cylinder.

The orientation was tested and found satisfactory.

The rain-gauge was cleaned and examined, and squeezes taken of the Beckley, the 8 inch, and the 5 inch rims.

For report on other instruments see page 82.

E. G. C.

IRELAND.

Valencia, October 1st–3rd.—The instruments at this observatory were found carefully attended to and in good order.

The clocks of both the barograph and thermograph were taken to pieces and cleaned, and new lines attached to the weight and winder of the latter instrument. The lenses, condensers, &c., received the usual cleaning, and the zero dots were shifted from the summer to the winter position. The action of the light stops was quite satisfactory.

I had the anemometer completely dismounted and cleaned all parts, the different bearings afterwards being replenished with fresh sperm oil. The fans were quite sound, but two of the cups were loose; these I had re-soldered and made fast before again erecting the instrument. The direction-shaft inside the Observatory was found a little loose at one of the joints; this was tightened up and a new pin put in to make it secure. The recording parts received attention, and the orientation was examined and found correct.

Mr. Cullum called my attention to the anemometer sheets recently supplied by the Office, which were not wide enough to be fastened by both clips to the cylinder, and in consequence one side had to be fastened down by adhesive paper.

The self-recording rain-gauge was also in good order with the exception of a defective pipe. The tube which conveys the rain from the funnel to the receiver was found cracked, and had been stopped up by putty. A new piece of piping was fitted and a new pen and ink supplied to the Observatory.

The stopping-arm to the rain-gauge for regulating the rise of the pen on the cylinder was found broken, this I have since had repaired by the maker.

For report on other instruments see page 79.

T. W. B.

B.—ANEMOGRAPH STATIONS.

ENGLAND AND WALES.

Alnwick Castle, September 12th.—I found this instrument to be in good order, and well oiled and cared for. The adjustment was nearly but not quite correct, and I was unable to attempt any improvement owing to the family being in residence.

For report on other instruments see page 83.

J. A. C.

Fleetwood.—Not visited this year.

Holyhead (Cup Anemometer), September 14th.—The anemometer had not been cleaned for nearly two years, and those parts which are not easily accessible were badly in need of examination. It was taken entirely to pieces and thoroughly overhauled. The direction gear was found to be working stiffly, and the vane, in consequence, was sluggish in moving with light winds. The spindle carrying the cups had worked loose and did not rotate evenly, and it had become a good deal worn as a result. Some of the stays to the cups were loose. The velocity spindle had become loose at a point where its upper and lower lengths are joined, and the pin fastening them had made a large hole in the outer and lower rod. I re-bushed the fitting, soldered the old pin in its place, and drilled a second hole at right angles, a little lower down, and inserted a second pin there. The cap stays I fastened by soldering, the nuts having rusted too much to allow of their being easily removed.

The clock was also taken to pieces and cleaned.

I tested again the position relative to the wind at which the vane comes to rest, and, later on, a further trial was made in the same way by Mr. Davis in a stronger wind. The result confirms what I previously found, viz., that the vane points South when the wind is blowing from S.S.W., and similarly all round the compass. In orienting the instrument this error is allowed for.

(To guard against any eddies affecting the experiments I tested the vane when the cups were dismounted, and fastened to the top of the cup spindle, which is a continuation of the axis of the vane, a long thread (15 feet), at the end of which was a light piece of ribbon. This showed very well the line of the wind, and made it easy to determine the divergence of the vane from it.)

I append Mr. Davies' note of the subsequent experiment he carried out in the same way with a much stronger wind than I had.

" The cups were taken down and a long rod fastened to the spindle. I then tied three pieces of " thread, five yards long, one on top of the stick, the other in the middle, the other at the base. The " three kept in line very satisfactorily, but with the vane as shown above. The direction of the wind " was W.N.W.; the force on Dines' pressure-tube from 40 to 45 miles per hour; on plate, 5 lbs. per " square foot."

Holyhead, September 17th, 1901.

(Signed) W. DAVIES.

The rod was fastened to the spindle in order to get a streamer a good distance above the vane, to ensure that the vane was not influenced by an eddy caused by the stand.

Holyhead (Pressure-plate Anemometer), September 14th.—This anemometer was in a very unsatisfactory state, partly due to corrosion of the vane causing too much friction to the rod attached to the plate, and partly, but to a lesser degree, to the stiffness of the wire connecting the plate with the spring.

The plate was dismounted and a friction roller on the rod removed; and the stiff brass wire was taken out and flexible copper wire cord, similar to that used for the bridled anemometer, was cut into short lengths and connected by swivels and substituted. The instrument then worked much better, and the pressures got in some strong winds experienced a few days later approximated very closely to the pressures indicated by the pressure-tube.

A substitute for the removed friction roller is necessary, and I have suggested one which, I think, will meet the needs of the case; and I would like to replace the wire cord now in use by a light chain of brass or steel, using the same swivels as now to prevent kinking. With this arrangement the lowest wind pressures would not be registered, since the pressure would have to be sufficient to lift the chain before it could affect the spring; but these smaller pressures are not needed so much, and I think we should certainly register anything from three pounds upwards.

It is due to Mr. Cotton and Mr. Davies to say that the anemometers at Holyhead are most carefully attended to, and Mr. Davies is very diligent and conscientious in changing the sheets and in making extra observations of the pressure-plate in strong winds.

Holyhead (Pressure-tube Anemometer), September 14th.—This instrument was opened and examined and the water found to be clean; but there was again a rather large amount of a pale-greenish deposit spread on the bottom of the container. The sealing cover, up to the water line, was much corroded along the seam, with a deposit which was, in one place, especially thick. The bottom of the container was found to leak slightly, and the leak was found and stopped.

As the vane had not been removed for three years, and as it appeared to move stiffly, I got it down and cleaned it Dust, &c., had got into it, but in other respects it was in good order, and when placed it turned as freely as could be desired.

The clock was also opened and cleaned, and the instrument left in good working order.

Holyhead (Bridled Anemometer), September 14th.—This instrument was dismounted and cleaned in every part, including the clock, and left in good order.

The wheel pen in use shows signs of getting worn out, the little bucket carrying the ink being somewhat corroded. When a new one is required I think the present pen can be improved by using a shorter arm, and putting the wheel close to the rigid arm which is fixed to the cup spindle. By so doing the vibration, which is unavoidable with a long arm when it is moved rapidly by a gust of wind, will be prevented.

A supply of wire cord is needed for this instrument.

Mr. Davies told me that the ink in this pen, which is the usual anemometer ink fed to the wheel by a small wick, only needs renewal once in two months, and that it has gone so long as three months before being renewed. The reservoir is quite open to the air, and is not protected by a cover of any kind. The trace it makes is excellent.

For report on other instruments see page 77.

R. H. C.

Scilly.—Not inspected this year.

Shields, North, September 16th.—I dismounted and thoroughly cleaned and oiled both the external parts and the recording apparatus. The exposed parts of the latter were very dirty, and coated with verdigris. The outside portions of the instrument were in good order and well oiled.

To minimise the difficulty caused by débris falling on the recording parts, Capt. Robson has fitted up a canvas covering, which serves its purpose very well.

The clock appeared to be in good order, and was going well. I therefore did not clean it or have it cleaned.

I tested the orientation and found it correct.

The approach to the anemometer is difficult and somewhat dangerous. I think an effort should be made to improve it.

For report on other instruments see page 78.

J. A. C.

Yarmouth, August 20th–22nd.—When I visited this station last year the weather was very unfavourable for out-door examination, but this year it was fine and dry and I was able to give the anemometer thorough attention.

The instrument is apparently r ularly lubricated, and the oil in the direction well was in a very satisfactory state, both as regards colour and fluidity. There was, however, but very little oil in the cup on the velocity spindle, and the assistant stated that he had considerable difficulty in lubricating it, so I had a larger hole drilled, and the channels deepened out, to allow the oil to run more easily, and a longer screw was fitted, so as to bring the head well above the cup arm.

All parts were thoroughly cleaned.

The exterior portion is in good order, and is kept well painted. The orientation was satisfactory. On examining the defective leg of the stand, to which I have drawn attention in previous years, the rotting was found to have extended down nearly to the principal under the roof.

It was decided to cut away one side of the support down to the solid wood, and bolt on a piece of 4½ × 2½ inch pine plank.

This was done, and the plank fastened on with coach bolts and angle iron, and made a good job of, and a sheet lead covering was fitted at the junction with the roof.

The interior parts of instrument, pencils, fusee clock, &c., were cleaned, and the spring on the pricker put right. I also tried to improve the backward loop of the velocity curve between 45 and 50 miles, and it should be better now.

For report on other instruments see page 78.

E. G. C.

SCOTLAND.

Deerness (*Orkney*), August 8th-9th.—The anemometer here, though well lubricated and apparently regularly looked after, certainly required cleaning, more especially the outer portion.

The oil for the direction bearings had become dirty and rather thick; it was all removed, bearings, &c., washed in paraffin, and fresh Sperm used, and all left in good order.

The cups, arms, and stays were in good condition, but had become rusty, so I had the exterior parts well painted, as well as the upper portion of the velocity spindle.

The clock was cleaned, but did not require a new line this year.

I spent considerable time in endeavouring to remove the defect in the foot of the velocity trace, and I am hoping now that the curves will be much improved in this particular, but it is not an easy thing to make the traces quite symmetrical without trueing the helix in the lathe, but I did the best I could in the matter.

The orientation was tested and was satisfactory. I found that the stonework at the base of the hut had warped away from the woodwork, more especially on the southern side, so I got the local stonemason to clear away the old mortar, fill in the interstices all round with cement, and make a new fillet, and this should prevent water running down the sides and rotting the wood base.

The ridges on the hut roof were also painted, but the rest of the building, fences, &c., can be left till next year.

E. G. C.

IRELAND.

Armagh, September 27th-28th.—At the date of my visit to this Observatory the weather was unfortunately wet and inclement, and in consequence I was unable to dismount the anemometer entirely. I found the instrument in good order, all parts were well oiled and carefully attended to. The cup shaft was taken down, and as far as I was able the bearings were lubricated with fresh sperm oil. The reducing gearing was seen to as well as the recording parts and clock, after which the orientation was tested and found correct.

The fans and cup stays were all quite sound. The self-recording rain gauge was also in good order and working satisfactorily. Rubbings were taken of its funnel as well as that of the spare gauge.

A new pen was supplied to Dr. Dreyer for the rain gauge.

For report on other instruments see page 83.

T. W. B.

Dublin, *Phœnix Park*, September 18th.—The anemometer required cleaning and it was entirely dismounted for this purpose. Some of the bevilled wheels geared too deeply, owing to wear, and washers were put to remedy this. The vents in the brake box had been left full open at the last inspection, and to this the too great freedom of the vane was due; there was also an insufficient quantity of oil in the box, and the hole at the top of the box had not been closed, allowing dirt, &c., to get to the oil. These defects were made good. The clock was taken to pieces and cleaned. The orientation mark was examined and found good, and the instrument left in good order.

The stand on which the anemometer is placed is showing signs of decay at the ground level, and in a strong wind it vibrated a good deal. This I reported to Captain Rotherham, R.E., the officer in charge in Major Haines' absence, who promised to have it seen to.

The instrument is evidently well attended to.

For report on other instruments see page 83.

R. H. C.

Kingstown, September 20th.—This anemometer is erected upon a small house built for it near the Northern end of the Eastern breakwater of the harbour. The ridge of the roof of the house is 12 feet from the roadway, and the fans are raised 4 feet, and the cups 6 feet, above the ridge. On the Southern side a stone wall rises 7 to 8 feet above the road, and is brought close up to the house; on the Northern side the wall consists of huge blocks of stone placed side by side, and is only from 4 to 5 feet high. Outside, the breakwater runs down to the sea in a long "ramp"; but inside there is first a lower roadway below that on which the house stands, and then the quay wall and the water. The direct distance from the shore is considerable (about one-third of a mile), but the position is affected, as regards wind, by the hills to the Southward, and more immediately by the low elevation of the cups above the breakwater, and by the walls, &c., surrounding the house. I suggested raising the cups upon an iron stand 10 or 12 feet (higher if possible) above its present level, and I understood that if the suggestion is made to the Board of Works it will probably be adopted. This would certainly make the record of wind far more valuable.

The instrument was sadly in need of cleaning, and as the recording portion is quite unprotected by any casing it was full of dirt and grit. This portion was cleaned, as was also the exterior portion, the clock oiled, a defect in the gearing of the pencils remedied, and the instrument left in good working order. I also explained to Constable William Foote, who attends to the instrument, how the papers should be changed, &c.

Mr. Robert D. Gray, C.E., Harbour Lodge, is the engineer to the harbour, and has immediate control of the anemometer as the representative of the Board of Works. He promised to have made at once a case for the clock and the recording part of the instrument.

The lubricant in use is not very good, and I promised that a supply of our sperm oil should be sent.

A good orientation mark has been cut on the breakwater by Mr. Gray, and the instrument is now properly set by it. I thought the vane was pointing very well in the direction of the wind, but this I could not test with great accuracy, and it should be again seen to.

For reports on other instruments see pages 86 and 92.

R. H. C.

C.—Sunshine Stations.

England and Wales.

Aspatria.—See page 79.

Bath, September 6th.—For report see page 77.

Bournemouth, October 1st.—Since last year a new sunshine recorder (Campbell-Stokes) has been mounted here on the summit of a water tower in Meyrick Park. The recorder has been accurately adjusted, and its exposure is good, excepting that in summer time the sun's rays are cut off before 4 a.m. by a balustrade on the tower. I visited the old recorder which is still in use at the cemetery; the exposure is unsatisfactory owing to trees, which, in winter time especially, must interfere with the working of the instrument. The observer sends us on his weekly return, the records of each instrument, and we have been in the habit of publishing these taken at Meyrick Park. I recommend that this practice be continued.

F. J. B.

Buxton.—See page 80.

Churchstoke.—See page 80.

Cirencester.—See page 84.

Cockle Park, Morpeth.—See page 80.

Colwyn Bay, September 7th.—Since this station was last inspected the recorder has been moved to a new and much better site upon the hill which rises behind the town. The horizon is nearly perfect and the record should be far more reliable than before.

R. H. C.

Cronkbourne.—See page 80.

Cullompton.—See page 84.

Haverfordwest, September 2nd.—The sunshine recorder has an admirable exposure on the cover of a waterworks reservoir, about 220 ft. above the sea. It is a recorder of Swiss make with a ball, well ground and shaped, of 3·75 inch diameter. It is of the "Universal" pattern and to prevent the ball working out of centre during adjustment Mr. Phillips had inserted India rubber pads under the clamping screw heads. He had also turned a wooden template of a half circle to enable him to make the adjustment for centreing. The trace on the card when I saw the instrument was running high on the evening side. No sunshine was available. I took the bearings with a prismatic compass, setting out the meridian line of the instrument by the boring of the latitude clamp, and found the deviation of the compass from this line about 22° instead of 19°. The instrument has an iron base plate which fits into a square ring supported by brackets from a $2\frac{1}{2}$ in. iron supporting pipe. The iron base is clamped firmly to the iron ring by horizontal screws through the ring. Level adjustment has to be made by loosening the clamp-screws and tapping the base plate. This is difficult to carry out satisfactorily, and when the base plate is level the horns are not. The horns have been extended by Negretti & Zambra and no reliance can be placed on the levelling thereby. The time scale corresponds to that of $\frac{1}{2}\frac{1}{2}$ of the M.O. card, *i.e.*, $5\frac{1}{2}$ M.O. "Hourslines" = 6 sunshine hours. I made the best adjustment I could for latitude, for centreing, level and azimuth with the compass on September 2nd. The September 3rd card gave what was apparently a very satisfactory trace but there was no time taken. A barely exposed sun image when I first arrived before touching the instrument gave correct time. After my adjustment the reading of a similarly unsatisfactory image was, 4.40 image for 4.54, true local time, which is not very satisfactory. It is, however, to be left to see how the trace runs.

W. N. S.

Hoylake, September 5th.—The position of the instrument here is excellent, and ensures for it an unobstructed horizon. At the time of my visit I had an excellent opportunity of seeing how the record of this station is affected during easterly winds by the drifting smoke from the Liverpool and Birkenhead districts.

R. H. C.

Jersey (*St. Heliers*).—See page 77.

Littlestone-on-Sea.—See page 84.

Llandudno.—See page 80.

Newcastle-on-Tyne, September 14th.—The recorder was in excellent adjustment, and is very carefully attended to.

For report on other instruments see page 85. J. A. C.

Newton Reigny, July 30th.—For report see page 77.

Pembroke (*St. Ann's Head*).—See page 77.

Plumstead, June 25th.—The instrument at this station has been re-erected on a new site, which at present has an unobstructed horizon. The station is an important one for use in obtaining a summary of the sunshine conditions of the Metropolitan area, inasmuch as it is contiguous to what is probably its most smoky district. The recorder was readjusted and left in good order.

R. H. C.

Rhyl, September 7th.—The sunshine record is got from a twin Jordan instrument, which is placed on the pier in charge of the coastguard. The traces are destroyed as soon as measured, and therefore I could properly test neither the setting of the instrument nor the way in which its records are measured. The Town Council possesses two sets of good thermometers and a Fishery barometer, but both sets of thermometers are badly placed, and the management of the wet bulb was not at all understood. The chairman of the committee having charge of the observations asked for suggestions as to getting suitable instruments and their proper exposure, and said the Council was anxious to have reliable observations made. I consider that the station would be a valuable one, and promised that the Office would advise and assist in organizing the station as far as possible.

R. H. C.

Scarborough, September 11th.—The recorder is placed outside the town, on the northern side. The exposure is not very satisfactory, for to the north-east and east there are houses about 300 yards away, while to the south-west and west there are trees and a hill, all of which will cut off some sun at times.

I think some sunshine will always be lost in the mornings and evenings, and I estimate that the loss in winter will amount to as much as 1½ hours per day. In summer the loss will be less.

The instrument is carefully attended to by Mr. Larkin.

For report on other instruments see page 81.

J. A. C.

Sheffield (*Weston Park*), September 7th.—For report see page 81.

Sheffield (*Attercliffe*), September 7th.—The recorder is placed on the roof of the Public Baths in practically the centre of the manufacturing part of the city.

The exposure is very good, and in my opinion the instrument will record the possible bright sunshine at the station except for fifteen minutes in the winter mornings, and for twenty minutes in the winter evenings. In all probability, however, no record will be lost, since when the sun is so low as to be cut off by obstructions, it will seldom have power to burn through the smoky atmosphere.

Owing to the mode of access it is impossible to ensure that the cards shall be changed at any fixed hour.

The instrument was not cemented in its place, but it was promised this should be done.

J. A. C.

York (*Bootham*), September 9th.—The recorder has been slightly changed in position since last inspection. It now stands on a wooden frame, where it is more easily accessible, and less liable to accidental changes in adjustment. It was in very good adjustment on the day of my visit, and it appears to be very carefully attended to under the personal supervision of Mr. Richardson, M.A., the science master of the school.

For report on other instruments see page 92.

SCOTLAND.

Aberdeen.—See page 78.

Dundee.—See page 82.

Fort William.—See page 82.

Glasgow.—See page 82.

Strathpeffer—See page 82.

IRELAND.

Armagh.—See page 83.

Dublin (*Phœnix Park*).—See page 83.

Kingstown, September 20th.—The recorder here was found to be somewhat out of azimuth, and the latitude adjustment also was not quite correct. The cement by which the base was fastened down was removed, and after readjustment the instrument was again made secure.

R. H. C.

Markree Castle.—See page 83.

Parsonstown.—See page 83.

Valencia.—See page 79.

D.—Barograph Stations.

Rochford, October 3rd.—See page 85.

Waterford, September 3rd.—The instrument is a self-recording mercury barometer with a pendulum clock, erected in the hall of the Chamber of Commerce. The motion of a float of a syphon barometer is transmitted by watch-chain to an index which rises and falls on a stem, and every hour the mechanism presses a point against the card and punches a hole. The barometer read 30·1 without any temperature correction; my aneroid the same. The apparatus is elaborate, but the punctuations are invisible, and it might be worth while to suggest the substitution of a pen. The puncture is effected by a snail-cam at the foot of the apparatus.

W. N. S.

Comparison of Instruments.

The following tables give the corrections required to be applied to the readings of the various instruments to make them agree with the Inspector's standards :—

Barometers.

Telegraphic Reporting Stations.

Station.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	Remarks.
England and Wales.	Inches.	Inches.	Inches.	
Bath	29·843	+ ·014	—	
Dungeness	29·569	+ ·010	+ ·014	
Holyhead	30·039	+ ·003	+ ·005	
Jersey	30·417	+ ·004	+ ·013	
Liverpool (Bidston) ...	—	—	—	
Loughborough	29·970	− ·007	—	
Newton Reigny	—	—	—	
Oxford	—	—	—	
Pembroke (St. Ann's Head)	29·972	+ ·014	+ ·017	
Portland Bill	30·062	·000	+ ·002	
Scilly	—	—	—	Not visited.
Shields	29·326	+ ·012	+ ·005	
Spurn Head	30·044	+ ·012	+ ·010	
Yarmouth	—	—	—	
Scotland.				
Aberdeen	29·723	+ ·005	+ ·004	
Leith	29·960	+ ·002	+ ·006	
Nairn	30·033	− ·001	+ ·002	
Stornoway	—	—	—	Not visited.
Sumburgh Head	29·716	− ·004	− ·008	
Wick	29·888	+ ·006	+ ·003	
Ireland.				
Blacksod Point	30·268	+ ·005	+ ·009	
Donaghadee	—	—	—	
Malin Head	29·552	+ ·008	+ ·021	
Parsonstown	29·658	+ ·010	—	
Roches Point	30·134	+ ·009	+ ·009	
Valencia	30·156	+ ·006	—	

BAROMETERS.

NORMAL CLIMATOLOGICAL STATIONS (Second Order Station, International Classification).

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
ENGLAND AND WALES.	Inches.	Inches.	Inches.	
Ampleforth	29·636	− ·013	—	
Aspatria	—	—	—	
Buxton	—	—	—	
Canterbury	29·492	− ·013	—	
Cheltenham	—	—	—	
Chester	29·863	+ ·019	—	
Churchstoke	—	—	—	
Cockle Park, Morpeth ...	29·748	− ·002	—	
Cronkbourne	—	—	—	
Fulbeck	29·762	·000	—	
Liverpool (Bidston) ...	—	—	—	
Llandudno	—	—	—	
Rousdon	—	—	—	
St. David's	29·873	+ ·008	—	
Scarborough	—	—	—	
Sheffield	29·544	− ·008	—	
Stokesay	29·236	+ ·011	—	
Stonyhurst	—	—	—	
Wessington Court ...	29·666	+ ·003	—	
Whitchurch	—	—	—	
Woolacombe	—	—	—	
York	29·864	·000	—	
SCOTLAND.				
Ben Nevis	—	—	—	
Cargen	29·474	+ ·012	—	
Dundee	29·610	·000	—	
Dunrobin	29·818	·000	—	
Fort Augustus	30·429	− ·001	—	
Fort William	30·382	+ ·006	—	
Glasgow	29·833	− ·004	—	
Glenlee	29·777	+ ·004	—	
Lairg	29·355	+ ·020	—	
Laudale	30·405	− ·007	− ·004	
Ochtertyre	29·496	+ ·015	—	
Pinmore	29·840	·000	—	
Strathpeffer	29·752	+ ·001	—	
IRELAND.				
Armagh	—	—	—	
Belfast	—	—	—	
Dublin (City)	30,220	+ ·012	—	
" "	29·609	+ ·012	—	
Dublin (Phœnix Park) ...	29·814	− ·002	—	
Glasnevin	29·496	− ·015	—	
Kingstown	30·118	+ ·004	—	
Markree Castle	29·849	+ ·018	—	
Parsonstown	29·658	+ ·010	—	

Barometers.

Other Climatological Stations.

Station.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	Remarks.
England and Wales.	Inches.	Inches.	Inches.	
Alnwick Castle	29·912	− ·002	—	
Littlestone	29·663	+ ·003	—	
Newcastle-on-Tyne ...	29·834	− ·001	—	
Scotland.				
None.				
Ireland.				
Valencia (Knightstown)..	30·022	+ ·025	—	

Thermometers.

Telegraphic Reporting Stations.

Station.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Grass Minimum.	Spare.	Remarks.
England and Wales.	°	°	°	°	°	°	°	
Bath	—	—	—	—	—	—	—	
Dungeness	59·2	0·0	− 0·1	− 0·1	0·0	—	− 0·1	
Holyhead	60·1	− 0·2	− 0·3	+ 0·3	+ 0·3	—	− 0·1	
Jersey	59·2	− 0·9	− 0·1	− 0·1	+ 0·2	—	− 1·1	
Liverpool (Bidston) ...	67·0	0·0	− 0·5	− 0·5	0·0	—	—	
Loughborough	63·2	− 0·4	0·0	0·0	+ 0·1	+ 1·2	− 0·2	
Newton Reigny	—	—	—	—	—	—	—	
Oxford	62·5	− 0·4	− 0·3	− 0·4	+ 0·1	+ 0·4	—	
Pembroke (St. Ann's Head).	59·4	− 0·6	+ 0·1	—	+ 0·2	—	− 0·5	
Portland Bill	62·6	+ 0·1	+ 0·1	+ 0·3	+ 0·6	—	− 0·1	
Scilly	—	—	—	—	—	—	—	Not visited.
Shields	59·2	− 0·2	− 0·3	− 0·2	+ 0·7	—	—	
Spurn Head	62·7	− 0·3	+ 0·1	+ 0·3	− 0·2	—	—	
Yarmouth	65·4	0·0	− 0·2	− 0·5	+ 0·5	—	− 0·6	
Scotland.								
Aberdeen	60·5	− 0·1	− 0·1	0·0	− 0·1	—	—	
Leith	58·6	0·0	− 0·2	+ 0·1	+ 0·4	—	− 0·1	
Nairn	58·5	− 0·7	− 0·7	− 0·1	+ 0·2	—	− 0·1	
Stornoway	—	—	—	—	—	—	—	Not visited.
Sumburgh Head... ...	58·8	− 0·5	− 0·5	− 0·1	+ 0·5	—	− 0·2	
Wick	59·3	− 0·5	− 0·6	+ 0·1	+ 0·1	—	—	
Ireland.								
Blacksod Point	62·6	+ 0·6	+ 0·6	+ 0·8	− 0·4	—	+ 1·1	
Donaghadee	57·9	− 0·3	− 0·4	− 0·1	+ 0·6	—	0·0	
Malin Head	57·6	− 0·3	− 0·2	− 0·4	+ 0·1	—	− 0·4	
Parsonstown	63·9	− 0·5	0·0	− 0·3	0·0	—	− 0·3	
Roches Point	59·5	− 0·5	− 0·5	0·0	+ 0·3	—	− 0·5	
Valencia	58·6	− 0·5	− 0·5	− 0·1	+ 0·1	—	+ 0·1	

THERMOMETERS.

NORMAL CLIMATOLOGICAL STATIONS (Second Order Station, International Classification).

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Grass Minimum.	Spare.	REMARKS.
ENGLAND AND WALES.	°	°	°	°	°	°	°	
Ampleforth	58·8	− 0·1	0·0	+ 0·4	+ 0·1	—	—	
Aspatria	63·3	+ 0·1	0.0	− 0·1	+ 0·1	—	+ 0·2	
Buxton	58·8	− 0·3	− 0·3	− 0·2	− 0·2	—	—	
Canterbury	43·6	− 0·3	− 0·2	− 0·4	− 0·4	− 0·4	—	
Cheltenham	61·8	− 0·3	− 0·3	− 0·6	+ 0·8	+ 2·0	—	
Chester	64·0	− 0·2	+ 0·1	− 0·9	+ 0·1	− 0·1	—	
Churchstoke	66·6	− 0·2	− 0·3	− 0·1	− 0·3	+ 0·3	—	
Cockle Park (Morpeth)...	56·0	− 0·1	0·0	− 0·2	+ 0·7	− 0·3	—	
Cronkbourne	61·3	− 0·7	− 0·7	− 0·5	+ 0·1	+ 0·1	—	
Fulbeck	83·4	+ 0·5	− 0·2	+ 0·3	+ 0·4	—	—	
Liverpool (Bidston) ...	67·0	0·0	− 0·5	0·0	0·0	—	—	
Llandudno	61·2	0·0	0·0	0·0	0·0	—	—	
Rousdon	59·7	− 0·2	+ 0·3	+ 0·1	+ 0·7	+ 1·0	—	
St. David's	59·1	− 0·4	− 0·5	+ 0·3	0·0	+ 0·7	—	
Scarborough	63·4	0·0	0·0	− 0·1	+ 0·6	—	—	
Sheffield	57·6	0.0	− 0·3	0·0	+ 0·1	+ 0·3	—	
Stokesay	61·0	− 0·3	− 0·4	− 0·6	− 0·2	+ 0·4	—	
Stonyhurst	56·4	− 0·1	− 0·4	− 0·1	+ 0·5	+ 0·2	—	
Wessington Court ...	54·9	− 0·1	− 0·1	− 0·2	− 0·1	− 0·1	− 0·1	
Whitchurch	58·0	− 0·3	0·0	− 0·4	0·0	+ 2·5	—	
Woolacombe	63·3	− 0·3	− 0·2	0·0	0·0	—	—	
York	59·8	− 0·4	− 0·3	− 0·2	0·0	—	—	
SCOTLAND.								
Ben Nevis	54·6	0·0	+ 0·1	− 0·4	0·0	—	—	
Cargen	59·3	− 0·1	− 0·1	0·0	+ 0·2	—	− 0·5	
Dundee	60·6	+ 0·5	+ 0·5	− 1·4	+ 0·4	—	—	
Dunrobin	61·9	− 0·1	0·0	− 0·1	− 0·1	—	—	
Fort Augustus	58·7	− 0·1	− 0·1	− 0·2	+ 0·4	—	—	
Fort William	62·8	− 0·1	− 0·1	0·0	+ 0·1	+ 0·6	—	
Glasgow	52·0	—	—	0·0	− 0·1	—	—	
Glenlee	58·7	− 0·2	− 0·2	+ 0·2	− 0·1	—	—	
Lairg	58·6	− 0·3	0·0	0·0	0·0	—	—	
Laudale	60·4	− 0·1	− 0·1	0 0	− 0·2	—	—	
Ochtertyre	54·7	0·0	+ 0·1	+ 0·1	+ 0·1	+ 0·1	+ 0·1	
Pinmore	60·0	− 0·1	− 0·1	+ 0·2	+ 0·1	—	—	
Strathpeffer	58·0	0·0	0·0	+ 0·1	− 0·1	—	—	
IRELAND.								
Armagh	56·1	− 0·4	− 0·4	0·0	0·0	+ 0·6	—	The grass min. read at first 3·2 too low. The error could not be reduced below 1·9.
Belfast	60·3	+ 0·1	0·0	− 0·2	+ 0·3	—	—	
Dublin (City)	—	—	—	—	—	—	—	
Dublin (Phœnix Park) ...	61·1	− 0·5	− 0·7	− 0·4	+ 0·3	+ 1·9	− 0·9	
Glasnevin...	56·0	− 0·3	− 0·2	0·0	+ 0·4	+ 0·8	—	
Markree	58·4	− 0·1	− 0·3	− 0·6	− 0·1	+ 0·1	—	
Parsonstown	63·9	− 0·5	0·0	− 0·2	0.0	+ 1·1	− 0·3	

THERMOMETERS.

OTHER CLIMATOLOGICAL STATIONS.

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Grass Minimum.	Spare.	REMARKS.
ENGLAND AND WALES.	°	°	°	°	°	°	°	
Alnwick Castle	63·0	−0·2	−0·2	−0·1	+0·2	—	—	The maximum and minimum could not be properly compared owing to receptacle provided being too small.
Arlington Court	54·2	+0·1	−0·2	−0·2	+0·2	—	—	
Belmont	68·4	+0·1	0·0	+0·1	0·0	0·0	—	
Cirencester	62·5	+0·3	+0·1	−0·7	−0·7	+0·6	—	
Colly Weston	58·3	+0·1	+0·5	−0·2	+0·3	—	—	
Cullompton	64·0	−0·1	−0·5	0·0	+0·3	+0·5	—	
Hawarden Bridge ...	58·0	—	—	0·0	+0·2	—	—	
Littlestone	61·0	+0·1	+0·1	+0·2	+0·5	—	—	
Llandovery	53·8	—	—	−0·2	+0·2	—	—	
Newcastle-on-Tyne ...	58·6	−0·2	0·0	0·0	+0·1	—	—	
Rauceby	55·7	0·0	+0·5	−0·1	+0·2	—	—	
Shaftesbury	56·2	0·0	0·0	−0·2	0·0	—	—	
SCOTLAND.								
None.								
IRELAND.								
Killarney	59·1	—	—	0·0	0·0	—	—	
Kingstown	—	—	—	—	—	—	—	

THERMOMETERS.

OBSERVATORIES.

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Grass Minimum.	Spare.	REMARKS.
ENGLAND AND WALES.								
Falmouth	56·0	−0·6	−0·1	−0·5	+0·1	—	—	
Oxford	62·0	−0·2	−0·2	—	—	—	—	
Stonyhurst	56·0	−0·1	−0·4	−0·1	+0·5	+0·2	—	
SCOTLAND.								
Aberdeen	60·0	−0·1	−0·7	+0·1	+0·4	—	—	
Fort William	57·0	0·0	−0·2	+0·1	0·0	—	—	
Glasgow	59·0	−0·1	0·0	−0·1	+0·1	0·0	—	
IRELAND.								
Valencia	58·0	−0·7	−0·5	−0·1	0·0	—	—	

164. Submitted—The following Statement of Accounts :—

	£	s.	d.
Cash balance on 5th November	4,522	8	4
Receipts from 6th to 19th November	16	8	5
	4,538	16	9
Cheques drawn from 6th to 19th November ...	45	6	4
Cash balance on 19th November	£4,493	10	5

165. Submitted—The following list of publications, which had been received since the last meeting :—

Bell, Arthur H.—The alchemy of hoar-frost.

Berlin, Königlich Preussisches Meteorologisches Institut.—Abhandlungen. Band 1.

Brodie, F. J.—On the prevalence of fog in London during the 20 years 1871 to 1890.

Brussels, Société Royale de Médecine Publique et de Topographie Médicale de Belgique.—Congrès national d'hygiène et de climatologie médicale de la Belgique et du Congo. Bruxelles, Août, 1897. 1e partie, Belgique ; 2e partie, Congo. 2 vols.

Calderwood, W. L.—Water temperature in relation to the early annual migration of salmon from the sea to rivers in Scotland.

Devon.—Report of the Committee on the climate of Devon. Edited by A. Chandler and W. Ingham. 19th, 3rd series, 1900.

Halle, Kaiserliche Leopoldinisch-Carolinische Deutsche Akademie der Naturforscher.—Katalog der Bibliothek . . . bearbeitet von Oscar Grulich. 1. Band. Lief. 2. 3.

Hann, J.—Die Meteorologie von Wien nach den Beobachtungen an der K. K. Meteorologischen Central-Anstalt 1852–1900.

Hellmann, G.—Regenkarte der Provinzen Brandenburg und Pommern sowie der Grossherzogtümer Mecklenburg-Schwerin u. Mecklenburg-Strelitz.

London, Meteorological Office.—Meteorological observations at stations of the second order. 1898.

Manila, Observatorio.—Baguios ó ciclones Filipinos. Estudio teórico-práctico per el P. José Algué.

—— —— El baro-ciclonó-metro, por el P. José Algué.

—— *Observatory.*—The baro-cyclono-meter.

—— —— Interesting climatological data concerning the weather of Manila.

Mazelle, E.—Einfluss der Bora auf die tägliche Periode einiger meteorologischer Elemente.

Pola, Hydrographisches Amt der K. K. Kriegs-Marine.—Veröffentlichungen. Gruppe v. Ergebnisse der meteorologischen Beobachtungen in Pola für das Lustrum 1896–1900. Zusammengestellt von W. Kesslitz und H. Marchetti.

Regina, Department of Agriculture.—Annual report of the Department of Agriculture of the North-West Territories. 1900.

Sydney, Royal Society of New South Wales.—Journal and proceedings. Vol. 34, 1900.

63, *Victoria Street, S.W., December* 4, 1901.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	THE HYDROGRAPHER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

166. The Minutes of the last meeting (November 20th) were read and confirmed, subject to verbal corrections of the Reports of Inspectors.

167. *Marine Observations aboard Foreign Ships* (Minute 159).—The Secretary reported that the "Hermes" was loading at Penarth for the River Plate, and it was resolved in respect of the present voyage of this ship not to make an exception to the rule that instruments are not supplied to foreign ships.

168. *Publications—Daily Weather Report* (Minute 136).—Resolved—That a copy of the report be sent daily only on payment of the usual subscription, but that a copy be sent to Dr. Polis in fortnightly packets, free of charge.

169. *India Rainfall Data.*—Read—Letter (M.O. 1,820) from the Meteorological Reporter to the Government of India to the effect that statements of total monthly rainfall for all rain recording stations in all the Provinces of India would be supplied, if desired, to recipients who objected to the size of the present rainfall volumes and only required monthly data, and asking whether the Council wished to receive in future the present volumes of *Rainfall Data of India* or only the proposed volume containing the total monthly rainfalls.

It was agreed that it was desirable that the volumes of *Rainfall Data of India* should be received as at present (P.C. 2,722).

170. *Instruments—Callendar Recorder.*—The Secretary reported that the instrument installed for trial by the Cambridge Scientific Instrument Company in November, 1900 (Minutes No. 9 of November 7th, 1900, and 1899–1900, p. 14), had been dismounted for the alterations in the Office, and had not been re-erected. With a view to coming to a decision with regard to the instrument, he had ascertained that the cost of the installation, fitted complete, would be approximately £50.

He further reported that, in his opinion, a trustworthy record of the variation of temperature at the Office would be of substantial value in the course of the Fog inquiry and in other experimental inquiries.

It was resolved that the instrument be installed in the Office and the cost charged to the Fog inquiry account.

171. *Instruments—Aspatria.*—The Secretary reported that two grass minimum thermometers, sent in succession to Aspatria, had been broken in transit, and that a similar instrument sent to Darwen " in charge of the guard " had also been broken in transit.

It was resolved that Mr. Smith Hill be not charged for the two instruments broken, and that in future exceptionally fragile instruments, such as grass minimum and solar maximum thermometers, if supplied, be handed over to some person designated by the recipient to convey the instruments to their destination.

172. *Reports of Inspectors, Telegraphic Reporting Stations* (Minute 163).—It was resolved that thermometers with errors exceeding ·5° F. be recalled from the telegraphic reporting stations and replaced.

It was agreed to sanction the removal of the screen and raingauge at St. Ann's Head, as suggested.

173. *Recognition of Retiring Observers.*—The Secretary was authorised to present publications to Mr. J. T. Cook, of the Ordnance Survey Office, Southampton, in recognition of the excellent returns received from that Station since 1875, and to present a barometer to Mr. W. Kennedy, of Roche's Point, upon his giving up the work of the Reporting Station there after 40 years' service.

174. Submitted—The following report on the progress of the Fog inquiry :—

Reports are now being sent in weekly from 34 stations, viz., 30 Fire Brigade Stations, and from the following :—

Training Ship " Worcester," Greenhithe.

Electricity Works, between Bow and Poplar.

Forest Gate, beyond Stratford.

Kew Observatory.

16 Stations of the Fire Brigade are being supplied with wet and dry thermometers. Surface temperature thermometers will be supplied to the same stations as soon as experiments as to best method of exposure are completed.

A form for two hourly observations at Fire Brigade Stations will shortly be issued. It contains 22 questions, and should ensure an exhaustive description of the characteristics of each fog.

Application has been made to the Admiralty for observations to be taken from certain Coast Guard stations between Tilbury and Sheerness.

Application has also been made to the Commissioners of the Metropolitan Police for observations to be made by the Police force at—

Kingston-on-Thames.	Kings Cross.
Willesden.	Plaistow, Essex.
Hyde Park.	Barking, Essex.

Application has been made for observations to be taken at the Botanical Gardens, Battersea Park.

The Botanical Gardens, Regent's Park, have commenced observations.

Resolved—That Captain Carpenter's appointment (Minute 153) be continued.

175. *Logs.*—Read—A memorandum from the Marine Superintendent, stating that since the last meeting five logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

176. *Storm Warnings.*—Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the Coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on five days, the total number of districts warned being 18. In six districts the warnings were justified by subsequent gales (force 8 and upwards), and in five districts by strong winds (forces 6 and 7). In seven districts they were not required.

GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

None.

FRED. GASTER.

Forecasting Branch,
4th December, 1901.

177. *Reports of Work for November.*—Submitted—The following reports :—

MARINE BRANCH.

December 4th, 1901.

Examined 11 new logs.

For the district southward from the Equator, between the West coast of Africa and longitude 90° W., drawing monthly isobars. Adding to the South America monthly coastal charts suitable notes as to wind and weather features ; also isobars.

The North Atlantic and Mediterranean Pilot Chart for December passed for press ; those for January and February, 1902, forwarded to the lithographer for reproduction ; the one for March in preparation. Obtaining mean sea temperatures for January from observations in the 13 years 1878–1890, between 40° and 55° N., 10° and 50° W. ; and wind and fog data for February and March north of the 50th parallel. Distributing amongst steamship captains supplies of forms for recording observations of sea temperature, ice, &c.

Examination, preparation, and extraction of data in Office logs for the Indian Ocean district from 30° N. to 30° S.

Preparation of sea temperature charts for reproduction by photo-lithography.

Arranging a specimen of a short form of meteorological log.

CAMPBELL HEPWORTH,
Marine Superintendent.

MONTHLY RETURN OF INSTRUMENTS ON CHARGE.

1st *December*, 1901.

—	Barometers.	Aneroids.	Thermometers. Ordinary.	Maximum.	Minimum.	Solar Radiation.	Terr. Radiation.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
"A." ACCOUNT.													
Dr.													
On charge, 1st Nov....	15	72	126	108	103	—	—	55	41	2	—	—	
Received since ...	18	79	246	1	1	—	—	—	—	—	—	—	
	33	151	372	109	104	—	—	55	41	2	—	—	
Cr.													
Sent out during month	4	—	12	—	1	—	—	—	—	—	—	—	
On charge, 1st Dec. ...	29	151	360	109	103	—	—	55	41	2	—	—	
"M.O." ACCOUNT.													2 Sunshine Recorders. 5 Spheres. 1 Hygrograph. 1 Barograph.
Dr.													
On charge, 1st Nov. ...	27	3	70	12	8	2	6	18	18	3	1	—	
Received since ...	5	—	6	4	3	—	2	7	1	6	—	12	
	32	3	76	16	11	2	8	25	19	9	1	12	
Cr.													
Sent out during month	—	—	15	5	3	—	3	5	2	1	—	—	1 Barograph.
On charge, 1st Dec. ...	32		61	11	8	2	5	20	17	8	1	12	2 Sunshine Recorders. 5 Spheres. 1 Hygrograph.

4th December, 1901. R. F. WALLACE.

TELEGRAPHIC BRANCH.

1st July to November 1st, 1901.

Weekly Weather Reports.—All numbers published to date; with the first two, numbers of the Quarterly Summary, and the third quarter is in the printers' hands. The monthly summaries to August are issued; September is at the printers, and October is being prepared.

Daily Weather Report.—All numbers issued promptly, with monthly correction sheets up to *September*; October is in course of preparation. The "copy" for all the Charts IV. and V., on p. 5, has been prepared and the necessary ones issued to date.

Primary Checking of Storm Warnings.—Done to date.

Checking of 8.30 *p.m. Forecasts.*—Done to July but not yet summarized: still being pushed on.

Preparation of 10-*day Means for Germany.*—Done to date.

The New Means for the Weekly Weather Report.—Stations 1876–1900 have all been prepared, the values plotted on sectional paper and the curves roughly drawn. Rainfall values. During this time sick leave amounted in the aggregate to 21 days.

FREDC. GASTER.

November, 1901.

Daily Weather Report.—All numbers issued promptly to date. Correction sheets (monthly) in hand. October material ready.

Weekly Weather Report.—All numbers issued promptly. *Monthly Summaries*—September issued: *October* nearly ready for printer.

Primary Checking of Storm Warnings, 1901.—Done to date.

Checking of Daily (8.30 *p.m.*) *Forecasts.*—July, August, September, nearly complete—results to-morrow. *October* also nearly complete, on revised plan. The new system of working this Branch has now been started, and has *nearly* settled down to its normal condition. There has been *considerable* delay from the fact that all had to become accustomed to the duties. The Plan of Working as now in force is appended herewith.

FREDC. GASTER.

Observatory Branch.

December 2nd, 1901.

Hourly Means.—Volume for 1898. There remain but 8 pp. of proof to complete this volume; with this exception the whole of the work has now been passed for press.

Volume for 1899. The tables for Valencia are about half completed.

Mean temperature Tables for the British Isles.—The data received from the Statistical Branch have been prepared for press, and are now quite ready for the printer. Data for 12 stations, representing districts for which no information was available in the Office, have been extracted from publications of the Royal Meteorological Society and prepared for inclusion in this work in the form adopted for the other stations. An introduction, with brief discussion of the results derived from the thermograph observations, has been prepared and sent to press. Proof has been revised and passed for press up to p. 40; and proofs of four plates of diurnal curves have been revised and returned for alteration. The harmonic analysis of five-daily means is now in hand.

Miscellaneous.—Re-arrangement of documents and curves in Rooms VIII. and IX. owing to re-organization of Office.

Anemograms to November 23rd received from Holyhead and Fleetwood and tabulated; copies of results sent to Dublin and Southport.

Report on Inspections prepared for Council.

Pattern of Scale for testing anemogram forms prepared.

"Diary of Operations at Observatories" for 1902 prepared and passed for press.

Inquiry.—For Major Bellasis, Toronto, respecting amount and frequency of rapid falls of temperature.

Assistance from Telegraph Branch.—Thirty-four days' wind direction and seven days' velocity (April 1–27 direction only and May 1–7 direction and velocity) have been tabulated from Shields anemograms. Mr. Francis has tabulated Yarmouth anemograms (velocity) for January and February, 1901.

Mr. Powers has been occupied on telegraphic work until 0·30 p.m. daily since November 12th.

R. H. Curtis.

Statistical and Library Branch.

Issue of Publications :—

Daily and Weekly Publications regularly issued.
Quarterly Summary of Weekly Weather Report (third quarter) received and issued.
Monthly Pilot Chart for December.
Return from Stations of the Second Order, 1898 (O. 152) received and issued.
Appendix XI. to Annual Report received and partly issued.

Statistical and Station Work :—

Tables for Weekly Weather Report prepared to date.
Tables and working maps for Monthly Supplement to the Weekly Weather Report for October, 1901, completed.
Tables for Quarterly Summaries of the Weekly Weather Report (fourth quarter) prepared to date.
Ten-day means supplied to Dr. Neumayer, Hamburg, to date.
Results for Registrar-General of Ireland's weekly reports regularly supplied.
Assistance rendered daily in the preparation of the "Daily Weather Report."
Returns from Stations of the Second Order for 1899 in hand.
Report of Inspections, 1901, prepared for "Minutes."
Index to Annual Report in hand.

Transfer of old records to storeroom in basement, viz. :—

Returns from Stations of the Second Order which have been published *in extenso* on Form A., 1872 to 1895.
Monthly returns from Telegraphic Reporting Stations, 1873–1898.
Weekly returns from Climatological Stations, 1872–1898.
Monthly returns from stations in connexion with the Army Medical Department, Home and Foreign, 1866–1886.

Library :—

Books received and catalogued, as reported in Minutes.

Inquiries :—

1. Dr. Power, Kingstown.—As to the mean temperature at Bournemouth for each month of 1898, 1899, and 1900. (M.O. 1,672.)
2. The Director of Works, Admiralty.—As to the average monthly rainfall at Portsmouth. (M.O. 1,700.)
3. Capt. Richards, Hydrographic Department.—As to an investigation on Fog in the British Islands.
4. Mr. G. C. Tijou.—As to the velocity of the wind and the weather at Yeovil on August 6th, 1901. (M.O. 1,713.)
5. Messrs. Burchells & Co.—As to the rainfall on July 25th, 1901. (M.O. 1,744.)

6. **Mr. R. B. Wilkinson.—As to the relative amounts of rainfall and duration of bright sunshine at 7 places in the British Isles and 7 places on the Continent.** (M.O. 1,738.)

7. **Mr. V. L. Raven, for N.E. Railway.—As to the monthly rainfall at Kirkby Stephen.** (M.O. 1,771.)

8. **Mrs. Winkworth.—As to the rainfall at Falmouth in 1900 and 1901.** (M.O. 1,758.)

9. **Messrs. Littlebury, Bros.—As to the temperature, rainfall, and sunshine results at Liverpool for the 12 months ending October, 1901.** (M.O. 1,781.)

JOHN A. CURTIS.

In addition to the enquiries referred to above there were 29 personal enquiries during November for forecasts or other weather information and 15 enquiries by telegraph.

178. Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 19th November	4,493	10	5
Receipts from 20th November to 3rd December	11	12	3
	4,505	2	8
Cheques drawn from 20th Nov. to 3rd Dec. ...	895	12	8
Cash balance on 3rd December...	£3,609	10	0

179. Submitted—The following list of publications which had been received since the last meeting :—

Araujo, J. M.—Ideas médicas acerca de la atmósfera de Sucre—su clima.

Eredia, F.—Relazione tra le macchie solari e la pioggia in Sicilia nel periodo 1881–1900.

Marriott, W.—An account of the bequest of George James Symons, F.R.S., to the Royal Meteorological Society.

Riccò, A.—Deformazione del disco solare all' orizzonte per causa della rifrazione atmosferica.

Riccò, A., e Eredia, F.—Risultati delle osservazioni meteorologiche del 1900 fatte nel R. Osservatorio di Catania.

Sarajevo, Bosnisch-Hercegovinische Landesregierung.—Ergebnisse der meteorologischen Beobachtungen an den Landesstationen in Bosnien-Hercegovina im Jahre 1898.

Shaw, W. N., and Cohen, R. W.—On the seasonal variation of atmospheric temperature in the British Isles, and its relation to wind-direction, with a note on the effect of sea temperature on the seasonal variation of air temperature.

Trieste, Osservatorio Astronomico-Meteorologico.—Rapporto annuale . . . . contenente le osservazioni meteorologiche di Trieste e di alcune altre stazioni Adriatiche per l'anno 1898. Vol. 15.

Vienna, Kaiserliche Akademie der Wissenschaften.—Denkschriften. Math.-naturw. Cl. 73. Bd. Jubelband zur Feier des fünfzigjährigen Bestandes der K. K. Centralanstalt für Meteorologie und Erdmagnetismus.

Watts, H. M.—The forecaster and the newspaper.

63, *Victoria Street, S.W.*, 18*th December*, 1901.

PRESENT :

PROFESSOR DARWIN, IN THE CHAIR.

THE HYDROGRAPHER. | MR. SHAW (*Secretary*).

180. The Minutes of the last meeting (December 4th) were read and confirmed.

181. *Northern Lighthouse Board—Additional Storm Signal Stations* (Minute 155).—Upon the report of the Hydrographer to the effect that the coasts in the neighbourhood of the lighthouses mentioned in the letter of the Northern Lighthouse Board (M.O. 1777) were, in his opinion, sufficiently supplied with storm warnings, a draft letter (P.C. 2813) to the Secretary of the Board asking for further information and making enquiry as to the exhibition of signals after dark was approved.

It was resolved that a circular be sent to all storm signal stations to enquire whether signals are made at night by means of lanterns.

182. *Suggested Shortened Form of Log* (Minutes 125, 144).—Upon the report of the Hydrographer, a general approval was given to the suggestion to issue a shortened form of meteorological log. The Hydrographer was requested to report further upon the details of the form.

183. *Publications: Hourly Means.*—The final proof of the volume of *Hourly Means* for 1898 was submitted and approved.

184. *Publications: Temperature Tables.*—Specimen tables of the second part of the Temperature Tables, showing mean maximum, mean minimum, and mean daily temperature deduced from the maximum and minimum for each month of the year, for varying periods, for 117 stations in the United Kingdom, were submitted and approved.

A general approval was also given to the Introduction and six plates showing the mean diurnal variation and the mean day to day variation of temperature at Aberdeen, Kew, Falmouth, and Valencia.

185. *Publications: Monthly Weather Summary.*—Some suggested alterations in the Monthly Summary of the Weekly Weather Report were considered and the further consideration of the Summary was postponed.

186. *Pilot Charts—Surplus Copies.*—The Secretary reported that he had been informed by the Stationery Office that a large number of copies of the back numbers of the Pilot Charts had remained unsold. (*See* Minute 114.)

He was directed to ask the Controller of the Stationery Office to place the surplus copies at the disposal of the Council.

187. *Logs.*—Read—A memorandum from the Marine Superintendent stating that since the last meeting four logs had been received, one of them being excellent.

The Secretary was directed to present Charts O. 59 to Captain R. Glegg, of the s.s. "MacDuff," and to return the best thanks of the Council to the other observers.

188. Submitted—The following report on the Forecasts, issued at 8.30 p.m. daily, during the month of July,* 1901 :—

The letters used have the following signification :—

a = complete success. | **c** = partial failure.
b = partial (*i.e.*, more than half) success. | **d** = total failure.

Districts.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	52	49	51	78
"	b	19	35	27	
"	c	13	10	11	
"	d	16	6	11	
Scotland, E.	a	71	52	62	83
"	b	13	29	21	
"	c	10	10	10	
"	d	6	9	7	
England, N.E.	a	61	45	53	87
"	b	19	49	34	
"	c	10	3	7	
"	d	10	3	6	
England, E.	a	48	68	58	83
"	b	23	26	25	
"	c	16	3	9	
"	d	13	3	8	
Midland Counties	a	78	77	78	91
"	b	16	10	13	
"	c	3	10	6	
"	d	3	3	3	
England, S.	a	71	71	71	87
"	b	16	16	16	
"	c	7	10	9	
"	d	6	3	4	
Scotland, W.	a	55	77	66	79
"	b	16	10	13	
"	c	23	3	13	
"	d	6	10	8	
England, N.W.	a	55	71	63	78
"	b	16	13	15	
"	c	23	6	14	
"	d	6	10	8	
England, S.W.	a	49	55	52	73
"	b	26	16	21	
"	c	19	16	18	
"	d	6	13	9	
Ireland, N.	a	39	55	47	68
"	b	29	13	21	
"	c	29	19	24	
"	d	3	13	8	
Ireland, S.	a	45	52	49	75
"	b	23	29	26	
"	c	23	13	18	
"	d	9	6	7	
Summary.					
British Islands	a	57	61	59	80
"	b	19	23	21	
"	c	16	9	13	
"	d	8	7	7	

* The Report for June is deferred, as the forecast book for that period has been mislaid.

Submitted—The following report on the Forecasts issued at 8.30 p.m. daily, during the month of August, 1901 :—

The letters used have the following signification :

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	29	71	50	83
"	b	42	23	33	
"	c	19	6	12	
"	d	10	0	5	
Scotland, E.	a	45	65	55	80
"	b	23	26	25	
"	c	32	6	19	
"	d	0	3	1	
England, N.E.	a	45	77	61	84
"	b	26	20	23	
"	c	26	3	15	
"	d	3	0	1	
England, E.	a	49	71	60	96
"	b	45	26	36	
"	c	6	3	4	
"	d	0	0	0	
Midland Counties	a	52	81	67	94
"	b	39	16	27	
"	c	9	3	6	
"	d	0	0	0	
England, S.	a	61	71	66	92
"	b	26	26	26	
"	c	13	3	8	
"	d	0	0	0	
Scotland, W.	a	39	74	57	82
"	b	35	16	25	
"	c	16	3	10	
"	d	10	7	8	
England, N.W.	a	36	74	55	84
"	b	45	13	29	
"	c	13	10	12	
"	d	6	3	4	
England, S.W.	a	52	77	65	87
"	b	35	10	22	
"	c	13	10	12	
"	d	0	3	1	
Ireland, N.	a	35	71	53	74
"	b	26	16	21	
"	c	29	7	18	
"	d	10	6	8	
Ireland, S.	a	36	74	55	79
"	b	32	16	24	
"	c	26	3	15	
"	d	6	7	6	
Summary.					
British Islands	a	44	73	59	85
"	b	34	19	26	
"	c	18	5	12	
"	d	4	3	3	

189. *Instruments.*—Submitted—A return of instruments supplied to the Royal Navy, in the quarter ended September 30th, 1901, in a revised form.

The return was referred to the Hydrographer for report upon the form before being printed.

190. *Instruments : Supply.*—It was agreed that with the sanction of the Admiralty (*see* M.O. 220, 1900), Captain Froggatt, of the s.s. "Knight Companion" of Portland, (Or.), U.S.A., Portland and Asiatic Steamship Company, be allowed to draw instruments from the Naval Depôt at Hong Kong for the purpose of keeping a meteorological log for the Office.

191. *Instruments.*—Reported—Since the last meeting of Council six grass minimum thermometers had been ordered for stock ; cost, £4 16*s.*

2 Approved.

192. Submitted—The following, as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on eight days, the total number of districts warned being 50. Of these 28 were followed by gales (forces 8 and more), 12 by moderate gales or strong winds (forces 7 and 6), and in 10 districts the signals were not justified.

GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

On evening of 12th and on 13th there was a strong N.E. gale felt on our N.E. coasts, for which there was no warning issued.

FREDC. GASTER.

193. *Telegraphic Stations.*—It was resolved that the usual bonus of £3 3*s.* be given to those of the telegraphic observers who have discharged their duties faithfully during the year (Minutes, 1878, p. 22).

194. Submitted—The following statement of accounts :—

Cash balance on 3rd December	£3,609	10	0
Receipts from 4th to 17th December...	17	17	4
	3,627	7	4
Cheques drawn from 4th to 17th December	273	9	6
Cash balance on 17th December	£3,353	17	10

195. Submitted—The following list of publications which had been received since the last meeting :—

* *Arctowski, H.*—Aurores Australes. Résultats du voyage du S. Y. Belgica en 1897–1898–1899.

Athens, Observatoire National.—Annales . . . publiées par D. Eginitis. Tome 3.

Bombay, Meteorological Office.—Brief sketch of the meteorology of the Bombay Presidency for 1900-1901.

Buchanan, J. Y.—Chemical and physical notes from the Antarctic Manual.

Budapest, Kön, Ung. Reichanstalt für Meteorologie und Erdmagnetismus.—Publicationen. 1901. Band 4. Die Blitzschläge in Ungarn in den Jahren 1890–1900. Von Ladislaus von Szalay.

———— *Statisches Bureau der Haupt- und Residenzstadt Budapest.*—Die Sterblichkeit der Haupt- und Residenzstadt Budapest in den Jahren 1891–1895 und deren Ursachen. Von J. von Körösy.

Calcutta, Meteorological Department of the Government of India.—Handbook of cyclonic storms in the Bay of Bengal. For the use of sailors. By J. Eliot. Vols. 1 and 2. 2nd ed.

———— *Surveyor General of India.*—General report on the operations of the Survey of India Department . . . during 1899–1900.

Claxton, T. F.—Remarks on the objects for which the Meteorological Society of Mauritius was established.

* Purchased.

Cohen, S. S.—A system of physiologic therapeutics. Edited by S. S. Cohen. Vols. 3 and 4. Climatology, health resorts, mineral springs, by F. Parkes Weber, with the collaboration for America of Guy Hinsdale. Two vols.

Copenhagen, Regia Societas Scientiarum Danica.—Tychonis Brahe Dani . . . operum primitias de nova stella summi civis memor denuo edidit Regia Societas Scientiarum Danica.

Dickson, H. N.—The mean temperature of the atmosphere and the causes of glacial periods. Read at Glasgow Meeting of Brit. Assoc., 1901.

Durban, Natal Observatory.—Report of the Government Astronomer for the year 1900.

Gautier, R.—Observations météorologiques faites aux fortifications de Saint-Maurice pendant l'année, 1899.

————Résumé météorologique pour Genève et le Grand Saint-Bernard, 1899.

Kay, James.—Abstract of meteorological observations made at Barone Cottage, Rothesay, 1899.

Lausanne, Institut Agricole.—Observations météorologiques faites à la station météorologique du Champ-de-l'Air. 1900, 14*e* année.

* *London, Nautical Almanac Office.*—The nautical almanac and astronomical ephemeris for the year 1902 for the meridian of the Royal Observatory at Greenwich.

———— *Royal Geographical Society.*—The Antarctic manual for the use of the Expedition of 1901.

Perth, Registrar-General.—Statistical register for the year 1900 and previous years. Part 12, Miscellaneous.

Russell, H. C.—Current papers, No. 5.

Shanghai Meteorological Society.—Eighth annual report for the year 1899. The atmosphere in the Far East during the six warm months; its normal state, its perturbations. Hints to navigators. By Rev. A. Froc.

————Appendix to the 8th report. Atlas of the mean isobars and mean directions of the wind in the Far East. Part 2. The six warm months. By Rev. A. Froc.

Sydney Observatory.—Snow storm, 27th–30th July 1901.

Vaughan, J. D. W.—Meteorological observations taken at Suva during 1900.

Zürich, Schweizerische Meteorologische Central-Anstalt.—Annalen. 1899. "Der Schweiz. meteor. Beob." 36 Jahrg.

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* Purchased.

63, *Victoria Street, S.W., January* 17, 1902.

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.	THE HYDROGRAPHER.
PROFESSOR DARWIN.	MR. SHAW (*Secretary*).

196. The Minutes of the last meeting (December 18) were read and confirmed.

197. *Re-constitution of Council—Payment of Directors* (Minute 134).—Read—The following letter:—

M.O. 1,848.

The Royal Society,
December 21st, 1901.

SIR,

YOUR letter of November 28th, enclosing an extract from the Minutes of the General Meeting of the Meteorological Council of November 6th, has been laid before the President and Council of the Royal Society, and I am instructed to inform you that the proposals therein contained meets with their approval.

I am, &c.,
M. FOSTER,
Sec. R. S.

The Secretary to
The Meteorological Council.

198. *Telegraphic Reports from Malta* (Minutes 90, 109).—Read—The following correspondence transmitted (M.O. 42) from the Colonial Office for the information of the Council:—

M.O. 42

The Palace, Valletta,
26th December, 1901.

SIR,

WITH reference to your despatch, No. 170, of the 17th December, enclosing further correspondence on the subject of the transmission of a daily weather telegram direct from Malta to Paris, I have the honour to state that on the receipt of your former despatch on the same subject (No. 102 of the 30th July) steps were taken in the direction of obtaining information that might enable this Government to make arrangements for substituting a daily telegram to Paris for that which had previously been sent from Malta to Rome, and which appears to have been, until lately, communicated to the Bureau Central Meteorologique in Paris by the Italian Government.

2. I beg to enclose a copy of the correspondence held recently with the Superintendent of the Eastern Telegraph Company in Malta, from a perusal of which you will observe that the (London) Managing Director of that Company is still in communication with the French Government in order to come to an arrangement on this subject.

3. As soon as I am acquainted with the result of these negotiations I shall not fail to communicate it to you, and to cause the arrangement to be given effect to if no difficulties will arise.

I have, &c.,
(Sgd.) F. GRENFELL,
Governor.

The Right Honourable
J. Chamberlain, M.P., &c.

Chief Secretary's Office, Malta,
26th November, 1901.

SIR,

THE Government of Malta has been approached on behalf of Mr. Mascart, the Director of the Bureau Central Meteorologique of Paris and President of the International Meteorological Committee on the advantage, to which importance is attached, of supplying him with a daily telegram of weather observations taken at Malta, to be incorporated in the "Bulletin International" published daily in Paris.

2. The Government is anxious to give effect to Mr. Mascart's wishes on this subject, and I should, therefore, feel obliged if you would kindly bring the matter to the notice of your Managing Directors, and ascertain whether they would be willing to authorise the Malta Station to forward daily, free of charge, a weather telegram of six groups of figures addressed to the Meteorological Office in Paris.

I have, &c.,
(Sgd.) G. STRICKLAND,
Chief Secretary to Govt.

A. W. Prosser, Esq.,
Manager—Eastern Telegraph Co.,
Malta Branch.

The Eastern Telegraph Company, Limited,
Malta Station,
19th December, 1901.

The Chief Secretary to Government.

SIR,

I HAVE the honour to inform you that your request for the free transmission of a daily group message to the Bureau Central Meteorologique, Paris, was duly forwarded to the Managing Director of this Company, and that I have now received a reply from him to the effect that he is in communication with the French Government on the matter, and will let me know as soon as the matter has been arranged.

I am, &c.,
(Sgd.) A. W. PROSSER.

199.—*Royal Meteorological Society—Kite Experiments* (Minutes 138, 154).—The Secretary reported that he had received a draft of an application for a grant of £250, which the Society were proposing to forward to the Government Grant Committee of the Royal Society. He was instructed to suggest to the Society that a copy of the reply of the Council to the application from the Society (P.C. 2,653) should be forwarded to the Government Grant Committee in support of the application.

200. *Paper by Professor C. Marti on the Causes of Storms, &c.*—Read—The following letter (M.O. 1,956) :—

M.O. 1,956

Admiralty,
17th December, 1901.

SIR,

I AM commanded by my Lords Commissioners of the Admiralty to transmit herewith, for your information, original and translation of a letter dated the 23rd ultimo from Professor C. Marti, of Nidau, Switzerland, and of its enclosures, regarding the causes of storms, &c., together with a further similar communication from that gentleman, received on the 12th instant.

I am to add that Professor Marti's letter has been acknowledged, and that he has been informed that the matter has been referred to the Meteorological Office.

I am, &c.,
EVAN MACGREGOR.

The Secretary,
Meteorological Office.

The Secretary was directed to express the regret of the Council that they were unable to carry out the investigation proposed by Professor Marti.

201. *Antarctic Co-operation* (Minute 9).—Read—Letter (M.O. 82) from the Hydrographer asking about arrangements for the disposal of the meteorological logs received in connexion with the Antarctic co-operation.

It was agreed to suggest, in reply, that the logs returned in connexion with the inquiry be stored in the Office until arrangements have been made with the Antarctic Committee for their disposal.

202. *Falmouth Observatory* (Minutes 15, 51).—The Secretary reported further correspondence (M.O. 716 and 1,987, 1901) on the proposed erection of a Dines anemometer at Falmouth, and also the result of an inspection of the site on October 7th, 1901.

It was resolved to ascertain whether an anemometer could be erected at the Coastguard Station in Pendennis Castle.

203. *Presentation Copies of Publications.*—It was agreed, on the recommendation of the Hydrographer, to approve the suggestion of the Marine Superintendent that Publications presented to Captains for excellent logs should bear the red label, hitherto affixed only to the first excellent log returned by a Captain.

204. *Telegrams from the Azores.*—Read—The following letter (M.O. 1,971) from M. Chaves, and a memorandum thereupon by the Secretary :—

M.O. 1,971.

Serviço Meteorologico dos Açores,
Ponta Delgada, S. Miguel,
le 28 Novembre, 1901.

TRÈS HONORÉ COLLÈGUE,

LE 14 Août dernier je me suis fait un devoir de vous communiquer l'établissement prochain du Service Météorologique des Açores (seulement subventionné par mon pays) sous ma direction générale, et tout à fait indépendant du Service Météorologique du Continent Portugais.

Le Service Mét[e] des Açores a commencé à fonctionner le 1[er] Octobre dernier.

De nouveau jé m'adresse à vous, pour vous communiquer que le câble de Horta à Waterville (Irlande) vient d'être lancé.

Nous avons donc actuellement de Horta les câbles :

Le câble Faial—S. Miguel—Lisbonne, le moins directe pour les dépêches météorologiques des Açores, pour les Bureaux météorologiques de l'Angleterre et de la France, et de service limité (douze heures par jour commencant à 9[h.] 54[m.] a.m. (t. m. de Greenwich), soit 8[h.] a.m., du t. m. d' Horta), ce câble est le seul employé jusqu' à présent pour les dépêches ci-dessus indiqués. On doit encore remarquer que les autres câbles sont de service permanent.

Comme vous pouvez voir à page 57 de mon *Rapport sur l'établissement projeté du Service Météorologique des Açores*, le Gouvernement de mon pays a accordé la permission de l'établissement de ces câbles sous la condition que les télégrammes météorologiques expédiés par eux entre les Observatoires des Açores et celui de Lisbonne fussent gratuits, jusqu' au nombre de trois télégrammes de dix mots par jour ; c'est donc probable que les compagnies concessionaires vous donnent ces télégrammes gratuitement seulement jusqu' à ses stations *terminus* (*Emden ou Waterville*) ; comme il se passe avec les télégrammes envoyés de Horta, depuis le 1[er] Octobre dernier, pour le *Weather-Bureau* de Washington, qui sont payés par le même Bureau dans son parcours de New York jusqu' à Washington. D'accord avec les idées de mon Gouvernement je désire bien vivement vous aider dans l'humanitaire et grandieux service de prévision du temps, confié à votre haute direction ; mais c'est évident que si éloigné, et isolé au milieu de l'Atlantique je serais le moins indiqué pour chercher à établir entre les trois Bureaux Météorologiques de l'Angleterre, de la France et de l'Allemagne un accord pour qu'ils profitent des observations établies aux Açores par mon pays, bien plus pour le profit des autres que pour le nôtre.

J'écris dans ce même sens à MM. Mascart et Neumayer, et j'espère donc de recevoir prochainement l'indication précise de ce que vous désirez du Service Météorologique des Açores sous ma direction, chiffre à employer etc. Il est aussi bien à désirer que vous entrez dans un accord sur le câble à employer, en vous adressant (les trois Directeurs, il me semble) à la Compagnie respective (voir aussi dans mon *Rapport*, pages 56–57, l'indication de ces Compagnies).

FRANCISCO A. CHAVES.

Monsieur le Directeur Shaw.

Azores.

The archipelago is situated approximately between Lat. 38½° and Lat. 39½° N. and Long. 25° and Long. 31° W.

It is proposed to establish not merely a single observing station but a meteorological service, with its centre either at S. Miguel or Fayal, and with stations at S. Miguel, Fayal, Flores, and a high level station at Pico.

Telegraphic communication already exists between S. Miguel and Lisbon, and is open between 8 a.m. and 8 p.m. local time (about 10 a.m. and 10 p.m. G.M.T.), and between San Miguel and Fayal, and from Fayal to New York. Communication by the new cable to New York is open always. New cables are to be laid between Fayal and Waterville and Fayal and Emden (Germany). The new cables are under a concession to the "Europe and Azores Telegraph Company." The Commercial Cable Company and Deutsche Atlantische Telegraphen Gesellschaft are mentioned as possible transferees of the concessions. There appears to be also an Eastern Azores Telegraph Company.

The projected meteorological service appears to include forecasts for the use of the islands and of ships, based on information collected in the island or from ships or by telegraph from Europe and America. Communication with ships can be carried out by two semaphores.

The concession to the Telegraph Company is conditional upon the Company transmitting telegrams gratuitously from the observatories of the Azores to that of Lisbon, "each observatory to be restricted to three free telegrams daily of 10 words each."

M. Chaves desires that the Meteorological Services of Great Britain, France, and Germany should continue to make use of the Azores Meteorological Service.

At present we receive gratuitously, *viâ* Lisbon, a daily telegram from the Azores. The readings are entered upon the Daily Weather Maps, but no special use is made of them. There can be no doubt that telegrams from the three stations which would give the gradient and movement of pressure would be much more useful than the single readings which we now receive, and probably would become essential if any extension of the time limit of our forecasts is attempted.

I therefore recommend that inquiries be made as to the terms upon which telegrams reporting in two groups observations from each of the three stations in the Azores in one telegram, the hour of observation to be either 8 a.m. Greenwich time or 3 p.m. local time (5 p.m. Greenwich), and that M. Mascart and Dr. Neumayer be consulted as to whether any joint action with the French and German Offices is practicable and desirable.

The recommendation was approved.

The Secretary was requested to report to the Council upon the practicability of using telegrams from the Azores in forecasting.

205. *Meeting of the International Committee.*—The Secretary reported that he had been asked by circular for a vote as to whether the next meeting of the Committee should be in 1902 or 1903, and whether the place and time of meeting should be London in the first week of September or coincident with the place and time of the British Association.

The matter was left to the discretion of the Secretary.

206. *Supply of Information to the Public.*—The Secretary reported (1) that he had received a request from an observer forwarding rainfall returns that copies of the returns should not be given if applied for, and that he proposed in future to state in reply that such a request was contrary to the practice of the Office; (2) that he had received a request from a firm of solicitors asking for the name and address of volunteer observers in order that they might be subpœnaed to attend in Court, and that he had replied that he was unable to furnish the names and addresses.

Approved.

207. *Telegraphic Reporting Stations—Roche's Point.*—Reported—That the observer, Mr. Kennedy, was proposing to retire on 1st March, 1902.

The Secretary was directed to arrange, if possible, for Mr. Kennedy's successor at the Telegraph Office to take up the duty of observing.

208. Read—A memorandum from the Marine Superintendent stating that since the last meeting 13 logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

209. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on 15 days, the total number of districts warned being 67. In 34 districts the warnings were followed by gales (force 8 and upwards), and in 21 districts by strong winds (forces 6 and 7). In 12 districts they were not required.

GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

16th January, 1902. FREDC. GASTER.

210. *Quarterly Return of Instruments* (Minute 189).—The new form was approved.

RETURN of ADMIRALTY INSTRUMENTS in the OFFICE and at HIS MAJESTY'S DOCKYARDS, for QUARTER ending September 30th, 1901.

Place and Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available 1st July, 1901	66	63	11	26	16	30
	Received, new	—	41	78	—	—	20
	„ repaired, cleaned.	24	40	—	12	18	—
	Total	90	144	89	38	34	50
	Issued	38	53	79	16	16	2
	Total available 1st Oct.	52	91	10	22	18	48

RETURN of ADMIRALTY INSTRUMENTS for the QUARTER ending 30th September, 1901.

Depôts.	BAROMETERS.								THERMOMETERS.															
	Mercurial.				Aneroid.				Ordinary.				Maximum.				Minimum.				Screens.			
	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.
Portsmouth	25	18	—	7	55	43	—	12	150	111	—	39	50	42	—	8	50	42	—	8	25	14	—	11
Devonport	25	27	2	—	55	55	—	—	150	154	4	—	50	59	9	—	50	51	1	—	22	21	—	1
Chatham	25	22	—	3	55	52	—	3	150	99	—	51	50	37	—	13	50	39	—	11	25	5	—	20
Sheerness	6	3	—	3	15	12	—	3	30	42	12	—	10	14	4	—	10	14	4	—	10	10	—	—
Queenstown	2	3	1	—	2	8	6	—	3	12	9	—	3	8	5	—	3	8	5	—	—	3	3	—
(Dockyards Home) Total	83	73	3	13	182	170	6	18	483	418	25	90	163	160	18	21	163	154	10	19	82	53	3	32
Gibraltar	2	2	—	—	2	1	—	1	4	9	5	—	3	3	—	—	3	3	—	—	—	—	—	—
Malta	11	10	—	1	15	9	—	6	60	68	8	—	10	14	4	—	10	11	1	—	1	3	2	—
Bombay	4	4	—	—	3	1	—	2	10	—	—	10	4	3	—	1	4	3	—	1	1	2	1	—
Halifax	3	4	1	—	4	4	—	—	20	19	—	1	4	1	—	3	4	1	—	3	1	2	1	—
Bermuda	3	1	—	2	4	6	2	—	20	4	—	16	4	4	—	—	4	5	1	—	1	2	1	—
Jamaica	3	3	—	—	2	4	2	—	10	13	3	—	2	—	—	2	2	1	—	1	1	1	—	—
*Cape of Good Hope	7	1	—	6	8	2	—	6	33	12	—	21	8	4	—	4	8	1	—	7	2	2	—	—
Trincomalee	3	3	—	—	3	4	1	—	10	20	10	—	4	5	1	—	4	5	1	—	1	1	—	—
*Hong Kong	17	4	—	13	21	7	—	14	87	—	—	87	21	6	—	15	21	7	—	14	5	9	4	—
Coquimbo	2	2	—	—	4	3	—	1	15	18	3	—	2	3	1	—	2	4	2	—	1	1	—	—
Sydney	5	3	—	2	6	9	3	—	25	28	3	—	6	4	—	2	6	7	1	—	1	1	—	—
Esquimalt	4	2	—	2	5	8	3	—	15	19	4	—	2	2	—	—	2	2	—	—	1	2	1	—
(Dockyards Abroad) Total	64	39	1	26	77	58	11	30	309	210	36	135	70	49	6	27	70	50	6	26	16	26	10	—
Grand Total and Net Shortage at Depôts	147	112	—	**35**	259	228	—	**31**	792	628	—	**164**	233	209	—	**24**	233	204	—	**29**	98	79	—	**19**
Meteorological Office... ...	45	**52**	7	—	120	**91**	—	29	250	**10**	—	240	80	**22**	—	58	80	**18**	—	62	50	**48**	—	2
Repairing	—	—	27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Returnable from Depôts ...	—	—	14	—	—	—	16	—	—	—	15	—	—	—	5	—	—	—	3	—	—	—	—	—
Ordered	—	—	20	—	—	—	109	—	—	—	350	—	—	—	75	—	—	—	75	—	—	—	—	—
Net Surplus or Shortage at M.O.	—	—	68	—	—	—	96	—	—	—	125	—	—	—	22	—	—	—	16	—	—	—	—	2

* Establishment numbers increased—*see* Minutes, p. 19, 1901-2.

SUPPLIES TRANSMITTED since 30th September, 1901.

	Barometers.	Aneroids.	Ordinary Thermometers.	Max.	Min.	Screens.
Portsmouth	5	10	42	10	10	—
Devonport	—	—	—	—	—	1
Malta	2	6	—	1	1	—
Bermuda	4	—	12	—	—	—
Cape of Good Hope	8	7	18	6	6	—
Hong Kong	12	12	12	11	11	3

211. *Fog Inquiry* (Minutes 153, 174).—Submitted the following memorandum :—

Proceedings since 4th December.—Special forms for two hourly observations during dense fogs have been issued to Fire Brigade Stations.

Wet and dry bulb thermometers have been placed at Southwark, Clerkenwell, Hammersmith, Great Marlborough Street, and Isle of Dogs, for observation on two hourly forms.

The temperature of the River water is being taken every day at half flood stream at Blackfriars Bridge. It is also being taken at Deptford Pier at 9 a.m., 3 p.m., and 9 p.m. every day.

Observations for the occurrence of fog have been commenced at five Coast Guard Stations between Tilbury and Sheerness. Observations are required between Tilbury and Woolwich.

The Commissioner of Police kindly consented to observations of fog occurrence being made by the Police at the centre of Hyde Park, at Barking and Plaistow in Essex, and at Kingston-on-Thames and Willesden.

With the permission of the Lord Great Chamberlain and of the Board of Works a thermometer screen has been erected on Victoria Tower, Westminster, at a height of 280 feet, at the foot of the tripod holding the flag pole. It contains a thermograph and a maximum and minimum thermometer, which are checked weekly.

With the permission of the Dean of St. Paul's Cathedral a thermometer screen has been placed in the Golden Gallery which runs round the tower above the dome. A thermograph and a maximum and minimum thermometer have been placed in the screen. The height is approximately 350 feet above mean river level, or 300 feet above the ground.

With the permission of Canon Henson, of Westminster Abbey, a thermometer screen has been placed in the churchyard opposite this office and a maximum and minimum and wet and dry bulbs placed therein. Observations are made at 9 a.m. and 3 p.m., and on two days of the week simultaneous observations are made at 3 p.m. with those on St. Paul's or on Westminster Tower. The observations already taken show a decrease in temperature of 1·5° at a height of 280 feet on Victoria Tower, Westminster, in normal weather.

No dense fogs have lain over Westminster since the thermometer screen was placed on the Tower.

The contamination of the air by smoke has been very forcibly brought to my notice by the ascents of Victoria Tower and of St. Paul's. In the 10 ascents made as yet, none of which were during fogs, and several of which were made on days of great visibility in the country, the visibility has ranged from ½ mile to 1¼ miles only. St. Paul's has not yet been seen from Westminster nor Westminster from St. Paul's, although their distance apart is but 1½ miles. The ascents have been made between 20th December and the present date.

Thermometric observations are also being taken for this Office at 9 a.m., 3 p.m., and 9 p.m., by Dr. H. R. Mill, at Camden Square, and by the keeper of the Battersea and Regent's Park botanical gardens, and a ground surface thermometer is being observed at Regent's Park one hour before sunrise.

The doings of 12 moderate fogs over London have been carefully discussed, but it would be premature to state that anything sufficiently definite on which to make forecasts of movement or distribution has yet arisen. The geological formation seems to have no part, and this is not surprising as London is so much built over made ground.

The open Parks report a far greater amount of fog than other stations, but this again may be from the enjoyment of a more extended view. For instance, some of the Fire Brigade Stations that were much shut in reported a singular freedom from fog. It is only the densest fog that is noticeable in narrow streets, whereas from Victoria Tower the view seems to be permanently befogged. When a considerable collection of fog movements and densities can be compared together with varied meteorological conditions, some interdependence may perhaps be found. The observing stations have only got into fair working order since the last moderately thick fog occurred, and it is a pity that the London County Council did not propose that the inquiry should commence in August.

The number of observing stations is now 44, and considerable correspondence is required to get the observations taken uniformly and returned punctually.

ALFRED CARPENTER,
Capt. R.N. (retired).

17th January, 1902.

Captain Carpenter's appointment was further continued.

212. Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of September, 1901 :—

The letters used have the following signification :—

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	57	74	66	91
,,	b	37	13	25	
,,	c	0	0	0	
,,	d	6	13	9	
Scotland, E.	a	73	57	65	89
,,	b	17	30	24	
,,	c	10	3	6	
,,	d	0	10	5	
England, N.E.	a	67	53	60	96
,,	b	27	44	36	
,,	c	3	0	1	
,,	d	3	3	3	
England, E.	a	73	53	63	83
,,	b	10	30	20	
,,	c	14	7	11	
,,	d	3	10	6	
Midland Counties	a	70	60	65	89
,,	b	20	27	24	
,,	c	7	7	7	
,,	d	3	6	4	
England, S.	a	63	53	58	88
,,	b	27	33	30	
,,	c	7	7	7	
,,	d	3	7	5	
Scotland, W.	a	70	80	75	94
,,	b	24	13	19	
,,	c	3	0	1	
,,	d	3	7	5	
England, N.W.	a	47	60	54	81
,,	b	27	27	27	
,,	c	13	13	13	
,,	d	13	0	6	
England, S.W.	a	57	55	56	83
,,	b	23	31	27	
,,	c	7	11	9	
,,	d	13	3	8	
Ireland, N.	a	50	66	58	85
,,	b	30	24	27	
,,	c	10	3	7	
,,	d	10	7	8	
Ireland, S.	a	50	52	51	85
,,	b	33	34	34	
,,	c	10	7	8	
,,	d	7	7	7	
Summary.					
British Islands	a	61	60	61	87
,,	b	25	28	26	
,,	c	8	5	7	
,,	d	6	7	6	

212 (*continued*). Submitted—The following report on the forecasts issued at 8.30 p.m. dailyduring the month of November, 1901 :—

The letters used have the following signification :—

a = complete success | **c** = partial failure.
b = partial (*i.e.*, more than half) success. | **d** = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	27	57	42	
"	b	47	40	44	86
"	c	20	3	11	
"	d	6	0	3	
Scotland, E.	a	43	64	54	
"	b	27	33	30	84
"	c	17	3	10	
"	d	13	0	6	
England, N.E.	a	70	70	70	
"	b	23	24	24	94
"	c	0	3	1	
"	d	7	3	5	
England, E.	a	47	80	64	
"	b	37	20	28	92
"	c	13	0	7	
"	d	3	0	1	
Midland Counties	a	53	77	65	
"	b	24	17	21	86
"	c	23	6	14	
"	d	0	0	0	
England, S.	a	73	77	75	
"	b	24	10	17	92
"	c	3	13	8	
"	d	0	0	0	
Scotland, W.	a	47	87	67	
"	b	27	13	20	87
"	c	16	0	8	
"	d	10	0	5	
England, N.W.	a	54	67	61	
"	b	30	27	28	89
"	c	13	6	10	
"	d	3	0	1	
England, S.W.	a	67	80	74	
"	b	27	20	23	97
"	c	6	0	3	
"	d	0	0	0	
Ireland, N.	a	40	63	52	
"	b	40	30	35	87
"	c	10	7	8	
"	d	10	0	5	
Ireland, S.	a	37	44	41	
"	b	43	43	43	
"	c	13	10	11	84
"	d	7	3	5	
		Summary.			
British Islands	a	51	70	61	
"	b	32	25	28	89
"	c	12	5	9	
"	d	5	0	2	

213. *Office Staff.*—The Secretary reported that Mr. E. J. Hood had returned to work after an absence of five weeks on account of his having had to undergo an operation on the right eye.

The Secretary was directed to ascertain what steps were being adopted at Public Offices with regard to the re-vaccination of the Staff, and to make similar arrangements for the Office.

He was also authorised to make arrangement whereby Mr. R. H. Curtis could make the necessary attendances in accordance with a medical certificate (M.O. 114).

214. Submitted—The following reports of work during the month of December, 1901 :—

MARINE BRANCH.

January 16th, 1902.

Examined 11 new logs.

For the district southward from the equator, between the west coast of Africa and longitude 90° W., adding isobars and remarks on the winds and the seasons on the South America monthly coastal charts.

The North Atlantic and Mediterranean Pilot Chart for January and the letterpress for February, 1902, also the Variation curves for 1905, passed for press. The Chart for March, 1902, completed. Preparing information for the April and May Charts, and obtaining the mean January and February sea temperatures, in 2° squares, for the 13 years. 1878-90, between 40° and 55° N., 10° and 50° W.

Examination, preparation, and extraction of data in Office logs for the Indian Ocean district, 30° N. to 30° S.

Preparing sea temperature charts of all oceans for reproduction by photo-lithography.

Discussing meteorological observations at various places on the coasts of South America and in the China Sea, for publication in forthcoming issues of the Admiralty Sailing Directions. (Letter M.O. 1,871.)

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

(December, 1901.)

Daily Weather Report.—All numbers issued, and the delay necessary by the intervention of the Christmas holidays was reduced to one day. Monthly correction sheet for *November* issued; December commenced.

Weekly Weather Report, 1901.—All numbers issued. Monthly supplement, *October*, gone for press, but not yet delivered.

Primary Checking Storm Warnings.—Done to date.

Checking of Daily 8.30 *p.m. Forecasts.*—September and November, done.

Everything now settled down on newly instituted plan of working.

Charts IV. (1 *and* 2) *and V. for Daily Weather Report.*—" Copy " ready for January and February.

Anemometry.—Tabulations (North Shields) handed in to Mr. Curtis, four months.

During this month I have been on annual leave for nine days, on Christmas leave two days, and inspecting one day; Mr. Francis on sick leave for six days; so that for three weeks of working days we have been one man short.

FREDC. GASTER.

Telegraph Branch,
17th January, 1902.

OBSERVATORY BRANCH.

January 1st, 1902.

Hourly Means.—Volume for 1898.—The remainder of the proofs have been revised, and the volume was finally passed for press on December 5th.

Volume for 1899.—The calculations required for the tables of mean results for Valencia are practically completed The preliminary copying of the hourly values upon working sheets has been finished for Fort William Observatory, and for about six months for Aberdeen.

Mean Temperature Tables for the British Isles.—Proof has been revised up to page 60. Proofs of two plates, with two overlays each, have been revised, and revised proofs of four other plates examined. Harmonic co-efficients have been calculated and curves drawn for each of the four Observatories. Mean results for 20 years for another metropolitan station have been calculated, and also means for Greenwich Observatory for 60 years so far as the data at present in hand will allow.

Examination of Observatory Work.—The temperature tabulations for Valencia for October and November have been examined. Upper zero-line values for thermograms determined and sent to Fort William.

Miscellaneous.—Holyhead anemograms tabulated weekly and sent to Dublin.

New form prepared for aneroidograms.

Daily means of temperature, November, worked for Kew Observatory.

Table of time angles prepared for each day of the year, for use with harmonic co-efficients.

Assistance from Telegraph Branch.—Anemograms for *Shields* have been tabulated as follows:—

1901.	*Direction.*		*Velocity.*	
March	31 days.		31 days.	
April	3 „	(28th–30th).	30 „	Completing month.
May	24 „	(8th–30th).	24 „	(8th–30th). Completing month.
June	30 „		30 „	
July	6 „	(1st–6th).	13 „	(1st–13th).
August	27 „	(1st–27th).	—	
	121 days.		128 days.	

Mr. Francis has done no work for this Branch this month.

Mr. Powers has been engaged in the Forecast Branch until about 0·15 p.m. each day.

R. H. CURTIS.

STATISTICAL AND LIBRARY BRANCH.

(Report for December, 1901.)

1. Issue of Publications:—

Daily and weekly publications regularly issued.
Monthly summary of the Weekly Weather Report for September, 1901, received and issued.
Monthly Pilot Chart for January, 1902, received and issued.
Issue of Appendix XI. to Annual Report proceeded with.

2. Statistical and Station Work:—

Tables for Weekly Weather Report prepared to date.
Tables and working maps for Monthly Supplement to the Weekly Weather Report for November, 1901, completed.
Tables for Quarterly Summaries of the Weekly Weather Report (fourth quarter) prepared to date.
Ten-day Means for certain Stations supplied to Dr. Neumayer, Hamburg, to date.
Results for Registrar General's of Ireland weekly reports regularly supplied.
Assistance rendered daily in the preparation of the "Daily Weather Report."
Returns from Stations of the Second Order for 1899 proceeded with.
Report of Inspections, 1901, for Minutes revised in proof, and Tables of Corrections, &c., prepared.
Index to Annual Report for 1900–1901 completed, and
Results for Cockle Park, Morpeth, for 1899 and 1900 on International Form B completed and sent to observer.

3. Library:—

Books received and catalogued as reported in "Minutes"
Books received from binders, 61 volumes, examined and passed.

4. Inquiries:—

1. Mr. F. B. Fowler.—As to Rainfall in London on April 13th, 1901. (M.O. 1,847.)
2. Messrs. Bramwell and Bird.—As to the Wind at Blythe Harbour on November 11-13, 1901. (M.O. 1,862.)
3. Messrs. Bramwell and Bird.—As to the Wind in the Tyne on November 11–13, 1901. (M.O. 1,863.)
4. Mr. C. M. Hemmann.—For various particulars regarding London Fogs. (M.O. 1,855.)
5. Messrs. Pettiver and Pearkes.—As to the Rainfall at Ilford on July 26–27, 1901. (M.O. 1,885).
6. Mr. R. F. O'Connor.—For daily Rainfall near Oakham for the years 1899, 1900, and 1901. (M.O. 1,927.)
7. Mr. D. D. Munro.—As to the results from Glencarron since Observations were begun there. (M.O. 1,900.)
8. Mr. J. T. Pearson.—As to the maximum and minimum temperatures in London and Lancashire for the past few years, and as to the weight of vapour contained in the air at different temperatures. (M.O.1,977.)

In addition there were 48 personal inquiries, of which 34 were without payment, while 14 paid for information to be supplied; there were also 15 inquiries by telegraph.

JOHN A. CURTIS.

MONTHLY RETURN OF "A" AND "M.O." INSTRUMENTS ON CHARGE.

December, 1901.

——	Barometers.	Aneroids.	Thermometers. Ordinary.	Thermometers. Maximum.	Thermometers. Minimum.	Thermometers. Solar Radiation.	Thermometers. Terr. Radiation.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
"A." ACCOUNT.													
Dr.													
On charge, 1st Dec. ...	29	151	360	109	103	—	—	55	41	2	—	—	
Received since ...	14	27	13	4	4	—	—	—	—	—	—	—	
	43	178	373	113	107	—	—	55	41	2	—	—	
Cr.													
Sent out during month	1	11	16	—	—	—	—	—	—	—	—	—	
On charge, 1st Jan. 1902	42	167	357	113	107	—	—	55	41	2	—	—	
"M.O." ACCOUNT.													
Dr.													
On charge, 1st Dec. ...	32	3	61	11	8	2	5	20	17	8	1	12	2 Sunshine Recorders. 5 Spheres. 1 Hygrograph.
Received since ...	1	—	13	12	—	—	—	2	10	—	—	—	
	33	3	74	23	8	2	5	22	27	8	1	12	
Cr.													
Sent out during month	2	—	46	3	1	—	1	10	13	—	—	8	
On Charge 1st Jan. 1902	31	3	28	20	7	2	4	12	14	8	1	4	2 Sunshine Recorders. 5 Spheres. 1 Hygrograph.

16th January, 1902. R. F. WALLACE.

215. Reported—That the cash accounts for the quarter ended the 30th September last had been this day examined by Prof. Darwin and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st July last, when there was a balance of £2,129 12*s.* 6*d.*, were £3,872 2*s.* 10*d.* against £3,742 17*s.* 1*d.* in the corresponding period of the preceding financial year. The payments were £3,601 0*s.* 4*d.* against £4,854 11*s.* 4*d.* during the same period in the previous year. The balance in hand and at the bank on the 30th September, amounted to £2,400 15*s.*, and at the same date in 1900 to £2,881 11*s.* 1*d.*

216. Submitted—The following statement of accounts :—

Cash balance on 17th December	£3,353	17	10
Receipts from 18th December to 16th January ...	5,037	9	7
	8,391	7	5
Cheques drawn from 18th December to 16th January	1,520	17	11
Cash balance on 16th January	£6,870	9	6

217. Submitted—The following list of publications which had been received since the last meeting :—

Aachen, Meteorologisches Observatorium.—Ergebnisse der Beobachtungen am Observatorium und dessen Nebenstationen. Jahrg. vi., 1900.

Adelaide Observatory.—Meteorological observations made at the Adelaide Observatory, and other places in South Australia and the northern territory, during the year 1898, under the direction of C. Todd.

Bangalore, Mysore Government Meteorological Department.—Meteorology in Mysore for 1900, being the results of observations at Bangalore, Mysore, Hassan and Chitaldrug. 8th annual report by John Cook.

Batavia, Observatorium.—Regenwaarnemingen in Nederlandsch Indië. 22. Jaarg., 1900.

**Bernacchi, Louis.*—To the South Polar regions. Expedition of 1898-1900.

Berne, Eidgenössisches Oberbauinspectorat, Hydrometrisches Bureau.—Wasserverhältnisse der Schweiz. Rheingebiet von den Quellen bis zur Taminamündung. Dritter Teil.

Calcutta, Meteorological Office, India.—The India weather review for the year 1900.

Collenette, A.—The rainfall of Guernsey for 1900.

—— The sunshine of Guernsey for 1900.

Havana, Observatorio del Colegio de Belen de la Compañia de Jesus. Observaciones magnéticas y meteorológicas. 1876-1878, 1900. 3 vols.

Lloyd's Calendar.—1902.

London, Meteorological Office.—Hourly means of the readings obtained from the self-recording instruments at the five observatories under the Meteorological Council. 1898.

Mexico, Sociedad Científica "Antonio Alzate."—Actas, resoluciones y memorias del primer Congreso Meteorológico Nacional iniciado por la Sociedad Científica "Antonio Alzate" y celebrado en la ciudad de México los días 1, 2 y 3 de noviembre de 1900.

Oña, Observatorio.—Observaciones meteorológicas hechas en el Colegio Máximo de la Compañia de Jesus en Oña, Provincia de Burgos. 1901.

Passalsky, P.—Anomalies magnétiques dans la région des mines de Krivoï-Rog. Préface par Boris Weinberg.

Rotch, A. L.—Meteorological observations with kites at sea.

St. Petersburg, Chief Hydrographical Department.—Meteorological and hydrological observations carried out in the summer of 1898 and 1899 by the expedition of the North Frozen Ocean under the command of Colonel Vilkitzki. In the Russian language.

Sieberg, A.—Die Uhranlage des meteorologischen Observatoriums zu Aachen.

—— Zwei im Jahre 1900 zu Aachen beobachtete Halos, sowie einige allgemeine Bemerkungen über derartige Phänomene.

Stockholm, Kongl. Svenska Vetenskaps-Akademie.—Meteorologiska iakttagelser i Sverige utgifna af Kongl. Svenska Vetenskaps-Akademien, anstälda och utarbetade under inseende af meteorologiska Central-Anstalten. Bd. 38. 2-dra ser., Bd. 24, 1896.

Strachan, R.—Narrative of the labours of Pascal and Perrier in relation to the barometer.

Streun, G.—Die Nebelverhältnisse der Schweiz.

Vanderlinden, E.—Contribution à l'étude des situations atmosphériques qui accompagnent le brouillard en Belgique.

Washington, Smithsonian Institution.—Annual report of the Board of Regents for the year ending June 30, 1900.

Worcester, W. D. C.—Rain making by concussion and reduction of temperature.

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* Purchased.

63, *Victoria Street, S.W., January* 31, 1902.

PRESENT:

PROFESSOR DARWIN, IN THE CHAIR.

THE HYDROGRAPHER. | MR. SHAW (*Secretary*).

218. The Minutes of the last meeting (January 17th) were read and confirmed.

219. *Telegraphic Reports from Malta* (Minutes 90, 109, 198).—The Secretary reported that observations from Malta had appeared daily in the Bulletin International, from January 18th.

220. *Paris Exhibition*, 1900.—Reported the receipt of a letter from the Secretary of the Royal Commission forwarding a Diploma of the award of a Grand Prix and intimating that a bronze medal would be forwarded in due course.

221. *Revaccination of Members of the Staff* (Minute 213).—The Secretary reported that he had made arrangements for the revaccination of members of the staff similar to those adopted at the Local Government Board and the Stationery Office, and that Mr. T. S. Stott had attended for the purpose on January 27th, and would attend on the corresponding day next week to examine the cases, at a fee of 5*s.* for each person. That 12 members of the staff had availed themselves of the arrangement, and that of the others, seven had already made private arrangements for revaccination, two intended to do so and two had been revaccinated comparatively recently. Five had already had small-pox, seven had been revaccinated, but not recently, while four had not been revaccinated and did not wish to be so. One is absent on sick leave and two others are unwell.

The payment of Mr. Stott's fees was authorised, and the Secretary was directed to report as to any further steps to be taken for the protection of the staff of the Office.

222. *Royal Meteorological Society.*—Reported—the receipt of a request from the Society (M.O. 151), as last year, for "a report upon the work done in the Meteorological Office during the past year, 1901, for insertion in the annual report of the Council."

The Secretary was authorised to draft a reply for the next meeting of the Council.

223. *The Sanitary Institute.*—Reported—the receipt of a request from the Sanitary Institute for the appointment by the Council of Delegates to attend the Congress of the Institute at Manchester on September 9th–13th, 1902.

The Secretary was directed to report upon the matter at the next meeting after consultation with the Chairman.

224. *Egypt—Survey Department.*—The Secretary reported that at the request of Captain H. G. Lyons he had given directions for a copy of the Monthly Pilot Charts to be sent to the Survey Department of Egypt; and that in the course of correspondence respecting meteorological observations in Egypt he had offered to send a copy of the Daily Weather report in weekly packets in exchange for the Egyptian Daily Weather Report issued by the Department sent similarly (M.O. 161, P.C. 233).

Approved.

225. *Daily Weather Report.*—At the request (M.O. 205) of the Director of the National Physical Laboratory it was resolved that a copy of the Daily Weather Report be sent to Bushey House, Teddington, in addition to that sent, as hitherto, to Kew Observatory.

226. *Publications.*—The Secretary reported that he had given directions for a requisition (M.O. 188) from the Stationery Office for two copies each "Daily and Monthly Weather Reports—all issues from October, 1899, to present, and as issued in the future" for the Department of Agriculture, &c. for Ireland, to be complied with.

Approved.

227. *Publications.*—Authority was given for the publication of the Temperature Tables of the British Isles (Minutes 79, 184) and of the annual summaries for the Weekly Weather Report, 1901, together with the summary for the last quarter of the year and the Preface to the Volume for 1901.

228. *Monthly Pilot Charts.*—In view of the completion of the first year's issue of the Charts it was resolved that a return be prepared showing the number of copies printed for the several months as well as the number of orders for the charts issued to observers, the distribution of the printed copies, official and for sale, the number of copies sold and the disposal of the remainder, together with a general report upon the publication and the method of distribution.

229. *Instruments.*—Submitted—the following Memorandum from the Marine Superintendent:—

The stock of M.O. hydrometers at this Office is now reduced to 16 (4 sets). The last supply was in June, 1898, when 100 hydrometers (25 sets) were received.

Only 13 marine barometers are at present available at this Office for issue to the Mercantile Marine. The last supply was in August, 1898, when 6 were received.

C. H.

January 31st, 1902.

It was resolved to order 25 sets of Hydrometers and 6 Barometers.

The Marine Superintendent was authorised to supply to Capt. Beavis, of the S.S. "Earl Point," a Marine Barometer of the "A" pattern to replace a barometer broken in his vessel in consequence of the "excessive vibration and jumping of the vessel in ballast trim." (M.O. 6.)

230. Read—a memorandum from the Marine Superintendent stating that since the last meeting four logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

231. Submitted—the following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council:—

WARNINGS ISSUED.

The Signals were hoisted on 5 days, the total number of districts warned being 38.

In 11 districts the warnings were justified by subsequent gales (force 8 and upwards) and in 18 districts by strong winds (forces 6 and 7). In 9 districts they were not required.

GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

January 31st, 1902.

232. Submitted—The following report on the Forecasts, issued at 8.30 p.m. daily, during the month of October, 1902 :—

The letters used have the following signification :—

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	35	68	52	84
,,	b	42	23	32	
,,	c	10	6	8	
,,	d	13	3	8	
Scotland, E.	a	36	55	46	78
,,	b	32	32	32	
,,	c	26	7	16	
,,	d	6	6	6	
England, N.E.	a	65	55	60	83
,,	b	16	29	23	
,,	c	16	13	14	
,,	d	3	3	3	
England, E.	a	39	45	42	76
,,	b	32	36	34	
,,	c	23	19	21	
,,	d	6	0	3	
Midland Counties	a	49	55	52	73
,,	b	19	23	21	
,,	c	26	19	23	
,,	d	6	3	4	
England, S.	a	32	64	48	82
,,	b	45	23	34	
,,	c	13	10	12	
,,	d	10	3	6	
Scotland, W.	a	49	78	64	88
,,	b	32	16	24	
,,	c	6	3	4	
,,	d	13	3	8	
England, N.W.	a	39	68	54	78
,,	b	26	23	24	
,,	c	32	6	19	
,,	d	3	3	3	
England, S.W.	a	26	62	44	76
,,	b	32	32	32	
,,	c	26	3	15	
,,	d	16	3	9	
Ireland, N.	a	29	61	45	69
,,	b	29	19	24	
,,	c	16	10	13	
,,	d	26	10	18	
Ireland, S.	a	32	65	49	76
,,	b	29	26	27	
,,	c	26	0	13	
,,	d	13	9	11	
Summary.					
British Islands	a	39	61	50	78
,,	b	30	26	28	
,,	c	20	9	15	
,,	d	11	4	7	

233. *Accounts.*—Submitted—The following Statement of Accounts for the nine months ending 31st December, 1901 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1900–1901	—	3,122 9 1	Administration :		
Parliamentary vote ...	—	10,500 0 0	Secretary	450 0 0	
Repayment of expenses charged under—			Salaries and wages ...	708 14 2	
(1.) Incidental expenses	16 13 5		Rent, fuel, and lighting	527 17 2	
(2.) Observatories ...	26 14 3		Incidental and contingent expenses ...	163 18 11	
		43 7 8	Furniture and fittings*	19 9 4	1,869 19 7
Supply of Information :			Special Researches :		
Daily Weather Charts and Forecasts ...	223 17 2		Salaries and other charges	—	392 18 9
6 p.m. Charts... ...	16 13 4		Land Meteorology :		
Reports for Press Agencies, &c. ...	152 18 6		Observatories and stations, including remuneration of observers	1,657 10 10	
Telegrams sent abroad	267 16 3		Salaries :— Discussion and reduction of observations, &c. ...	1,129 16 2	
		661 5 3			2,787 7 0
Sale of Instruments, &c. :			Weather Information and Forecasts :		
Mercantile Marine account	6 12 6		Telegraphic reports and storm warnings, remuneration of observers, &c.	1,967 8 3	
"M.O." (Stations) account	49 19 6		Salaries:—Preparation and issue of reports and forecasts ...	1,348 6 9	
		56 12 0			3,315 15 0
			Inspections :		
Repayment of Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	178 7 3	Salaries and travelling expenses	—	357 18 7
			Ocean Meteorology :		
			Salaries :— Discussion and reduction of observations... ...	1,022 14 5	
Commission charged on work done for Colonies, &c. ...	—	8 13 2	Expenses incidental to the supply of instruments :—		
			Proportion for care and issue of instruments	97 10 0	
Superannuation Account :			Royal Navy ...	366 19 5	
Annuities	106 5 0		Mercantile Marine	99 7 9	
Interest on Investment	18 11 4		Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	1,586 11 7
		124 16 4			360 16 6
			Superannuation Account :		
			Pensions and allowances...	514 5 0	
			Invested	1,500 0 0	
			Balance :		2,014 5 0
			Cash at Bank... ...	1,954 18 0	
			„ at Office ...	45 0 9	
			Advance for Travelling Expenses ...	10 0 0	
					2,009 18 9
		£14,695 10 9			£14,695 10 9

Liabilities.	£ s. d.	Assets.	£ s. d.
To sundry creditors	1,739 3 2	By cash at Bank and at Office ...	1,999 18 9
„ balance	1,832 1 11	„ H.M. Exchequer	975 0 0
		„ sundry debtors	596 6 4
	£3,571 5 1		£3,571 5 1

Note.—On December 31st the amount of 2½ per cent. Consols held by the Council for the provision of superannuation annuities was £1,576 16*s.* 4*d.*

* Some expenses not yet brought to account.

234. Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 16th January	6,870	9	6
Receipts from 17th to 30th January	75	16	3
	6,946	5	9
Cheques drawn from 17th to 30th January ...	635	4	3
Cash balance on 30th January	£6,311	1	6

235 Submitted—The following list of publications which had been received since the last meeting :—

Azambuja, G. A. de.—Annuario do Estado do Rio Grande do Sul. 1902. Anno 18.

Bolton.—Annual report of the Museums and Meteorological Observatory for 1901.

**Cotte, [L.]*—Traité de météorologie (1774).

Fritsche, H.—Die tägliche Periode der erdmagnetischen Elemente.

Grossmann, [L.]—Die Aenderung der Temperatur von Tagzu Tag an der deutschen Küste in den Jahren 1890 bis 1899.

—— Die Extremtemperaturen in Hamburg in den Jahren 1876 bis 1900.

Helsingfors, Finska Vetenskaps-Societeten.—Öfversigt af Finska Vetenskaps-Societetens Förhandlingar. 43, 1900–1901.

Hoylake, Urban District Council.—Table of meteorological records, 1901.

Mellish, H.—The weather of 1901 at Hodsock Priory, Worksop.

**Russell, Hon. Rollo.*—The reduction of town fogs.

Tacubaya, Observatorio Astronómico Nacional.—Anuario. 1902. Año 22.

Villa Colón, Observatorio del Colegio Pío de Villa Colón, Monte Video.—El año meteorológico. 1898–99 y 1899–1900 por el P. Juan de Dios Moratorio.

63, *Victoria Street, S.W., 14th February*, 1902.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN. | THE HYDROGRAPHER.

236. The Minutes of the last meeting (January 31st) were read and confirmed.

237. *Telegraphic Reports from Malta* (Minutes 90, 109, 198, 219).—Reported—The receipt of a memorandum (M.O. 251) from the Colonial Office enclosing a copy of the following letter from the Governor of Malta :—

M.O. 251.

The Palace, Valletta,
24th January, 1902.

SIR,

IN continuation of my despatch, No. 196, of the 26th December last, I have now the honour to acquaint you that the local Manager of the Eastern Telegraph Company informs the Chief Secretary to this Government that he has received a telegram from the Managing Director in London,

* Purchased.

saying :—"Meteorological service Paris commences immediately, limited to four groups daily"; and that the local Manager is, therefore, prepared to accept the usual cypher weather report for Paris direct.

2. The Director of Education, under whose supervision this service is conducted, has been instructed to cause this daily report to be furnished to the Eastern Telegraph Company here, for transmission to Paris, in the same way as this is done in regard to other countries.

I have, &c.,

The Right Honourable
Joseph Chamberlain, M.P., &c., &c.

F. GRENFELL,
Governor.

The Secretary was directed to send a letter thanking Mr. Chamberlain for his assistance in securing the service of telegrams asked for by M. Mascart, and asking him also to convey the thanks of the Council to the Governor of Malta. (P.C. 563.)

238. *Egypt—Survey Department* (Minute 224).—In compliance with the request of the Director General (M.O. 161) the Secretary was authorised to send the Weekly Weather Report in lieu of the Daily Report in return for the Egyptian Daily Report.

239. *Fishery Barometer—Burra Isle.*—Upon the application of the Fishery Board for Scotland (M.O. 2,032, 1901) it was agreed to supply a fishery barometer to Burra Isle, to be erected at Messrs. Fraser and Co.'s business premises, and placed in the charge of Mr. Thomas Sinclair, of Hamnavoe, Postmaster and Manager for Messrs. Fraser.

240. *Royal Meteorological Society* (Minute 222).—A draft memorandum drawn up by the Secretary for communication to the Society was approved. (P.C. 573.)

241. *Magnetic Observations at Valencia* (Minute 123).—It was agreed that the magnetic observations at Valencia be continued until July 31st, 1902, on the same terms as before.

242. *Land Stations—Hull* (*see* Report of Inspections, Minute 163, p. 84).—Reported—That, in reply to a request from the Secretary, the Corporation of Hull had expressed its willingness to send in a monthly return of weather observations by the Parks Superintendent.

The Secretary was authorised to express the thanks of the Council for the returns, and to incorporate them either in the Weekly or Monthly Weather Report.

243. *Observatories.*—The Secretary was directed to ask for a report on the work of the Kew Observatory and the Ben Nevis Observatory for incorporation in the Annual Report, as last year.

244.—Read—A memorandum from the Marine Superintendent stating that since the last meeting eight logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

245. Submitted—The following, as the result of the primary checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on five days, the total number of districts warned being 17. In four districts the warnings were justified by subsequent gales (force 8 and upwards), and in six districts by strong winds (forces 6 and 7). In seven districts they were not required.

GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

246. Submitted—The following report on the Forecasts, issued at 8.30 p.m. daily, during the month of December, 1901 :—

The letters used have the following signification :

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	36	86	61	90
,,	b	46	11	29	
,,	c	18	0	9	
,,	d	0	3	1	
Scotland, E.	a	29	72	51	76
,,	b	36	14	25	
,,	c	25	7	16	
,,	d	10	7	8	
England, N.E.	a	57	64	61	82
,,	b	18	25	21	
,,	c	11	7	9	
,,	d	14	4	9	
England, E.	a	55	55	55	79
,,	b	19	29	24	
,,	c	23	10	17	
,,	d	3	6	4	
Midland Counties	a	58	55	57	79
,,	b	10	35	22	
,,	c	22	10	16	
,,	d	10	0	5	
England, S.	a	55	65	60	84
,,	b	29	19	24	
,,	c	13	16	15	
,,	d	3	0	1	
Scotland, W.	a	52	83	68	85
,,	b	27	7	17	
,,	c	14	0	7	
,,	d	7	10	8	
England, N.W.	a	45	59	52	82
,,	b	35	24	30	
,,	c	17	10	13	
,,	d	3	7	5	
England, S.W.	a	58	71	65	86
,,	b	26	16	21	
,,	c	13	7	10	
,,	d	3	6	4	
Ireland, N.	a	30	74	52	77
,,	b	30	20	25	
,,	c	23	3	13	
,,	d	17	3	10	
Ireland, S.	a	43	50	47	80
,,	b	27	40	33	
,,	c	20	7	14	
,,	d	10	3	6	
Summary.					
British Islands	a	47	67	57	82
,,	b	28	22	25	
,,	c	18	7	13	
,,	d	7	4	5	

247. *Reports of Work for January*—Submitted—The following reports :—

MARINE BRANCH.

February 13th, 1902.

Examined 14 new logs and two lighthouse registers.

Districts south of the Equator, between the west coast of Africa and 90° W. longitude.—Adding isobars and notes on the winds and seasons to the monthly charts for the coastal regions of South America, and revising Charts as received from Admiralty.

Indian Ocean District—from latitude 30° N. to 30° S.—Preparing and extracting data in Office logs.

Preparing copy of Sea Temperature Charts for Atlantic, Indian, and Pacific Oceans for photo-lithography, for re-issue of official publication No. 59.

Monthly Pilot Charts of the North Atlantic and Mediterranean.—February Chart and the letter-press for March passed for press; April and May in preparation. Obtaining sea temperature results for January, and wind and fog results to north of 50° N. latitude for March. Registering and acknowledging reports of ice and sea temperatures, and issuing further supply of forms.

Sailing Directions for China Sea and South America.—Obtaining results of meteorological observations at several places for publication in new issue.

Preparing specimen of "Short Meteorological Log."

Enquiry from Messrs. Ballingall and Co.—Supplying details of weather between Cardiff and Gibraltar from December 10th to 20th, 1901.

CAMPBELL HEPWORTH,
Marine Superintendent.

OBSERVATORY BRANCH.

February 1st, 1902.

Hourly Means. — Volume for 1899. The preliminary copying of the hourly values upon working sheets has been finished for Aberdeen, and progress has been made with the calculations of mean results for Fort William. A commencement has been made in copying the Valencia results for the printer.

The mean results required for the Kew Annual Report for 1901 have been calculated, and were sent to Kew on the 29th.

Mean Temperature Tables for the British Isles.—Proof has been revised and signed for press up to p. 80, leaving 40 pp. to complete the work. Mean results for Greenwich for 60 years have been completed. Harmonic curves have been added to plates 5 and 6; the Introduction to the Tables has been completed; and proofs of the whole of the letterpress and of the 6 plates have been revised.

Examination of Observatory Work.—In addition to the examination of the documents and curves upon receipt, the Valencia temperature tabulations for December, 1901, and the Kew temperature and pressure tabulations for January to December, 1901, have been examined and checked.

Miscellaneous.—A revised aneroidogram form has been prepared, and proofs of rain-gauge form examined.

Holyhead anemograms tabulated weekly and sent to Dublin.

Assistance from Telegraph Branch.—Anemograms for Shields have been tabulated for 151 days as regards *direction*, and for 171 days as regards *velocity*, completing the year 1901.

Mr. Powers has been daily engaged in the Forecast Branch until about 0.15 p.m.

R. H. CURTIS.

FORECAST BRANCH.

Daily Weather Report.—All numbers issued promptly. Monthly correction sheet (exceptionally long) for December issued.

Weekly Weather Report.—All our portion of the work was handed in promptly, but there has been some friction with the lithographers, causing delay.

Primary Checking of Storm Warnings.—Done to date, and results handed in.

Checking of Daily (8.30 p.m.) Forecasts.—Done to end of December; report handed in.

Anemometry.—Tabulated for four months (Shields and Deerness), and results handed in.

Preparation of *Report on Times of Arrival of Foreign Telegrams*, in great detail, done.

Regular routine work of Branch attended to.

FREDC. GASTER.

STATISTICAL AND LIBRARY BRANCH.

1. Issue of Publications :—

Daily and weekly publications regularly issued.
Monthly summary of the Weekly Weather Report for October, 1901, received and issued.
Summary of the Weekly Weather Report for the Fourth Quarter, and for the whole year, 1901, received and issued.
Issue of Appendix XI. to Annual Report for 1899–1900 completed.
"Hourly Means" for 1898 (Official No. 151) received and issued.

Pilot Charts for February, 1902, received, and 130 copies issued. Also 302 copies for other months issued.

Presentation copies of publications, 52 in all, issued to captains and officers of ships.

Two sets of Daily Weather Reports, and Monthly Supplements to Weekly Weather Report, from October, 1899, to date, supplied to H.M. Department of Agriculture, Dublin.

2. Statistical and Station Work :—

Tables for Weekly Weather Report prepared to date.

Tables and working maps for Monthly Summary to the Weekly Weather Report for December, 1901, prepared.

Ten-day means for certain stations supplied to Dr. Neumayer, Hamburg, to date.

Results for Registrar-General's (Ireland) weekly reports regularly supplied.

Meteorological Tables for Registrar-General's (Ireland) Quarterly Return, October to December, 1901, prepared and sent.

Returns from Stations of the Second Order, 1899, proceeded with.

Results for York and St. Leonard's for 1901 prepared and sent to those stations for local publication.

Inspectors' reports of visits to stations in 1901, as printed in Minutes, sent to observers.

3. Library :—

Accessions to library received and catalogued, as reported in "Minutes."

Preparing 149 volumes of Reports, Returns, &c., for binding.

4. Inquiries :—

There were 8 inquiries by letter, 11 inquiries by telegraph, and 31 personal inquiries during January for forecasts or other weather information.

JOHN A. CURTIS.

METEOROLOGICAL OFFICE.—MONTHLY RETURN OF "A." AND "M.O." INSTRUMENTS ON CHARGE.

January, 1902.

—	Barometers.	Aneroids.	Thermometers. Ordinary.	Thermometers. Maximum.	Thermometers. Minimum.	Thermometers. Solar Radiation.	Thermometers. Grass Min.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
"A." ACCOUNT.													
On charge, 1st Jan., 1902	42	167	357	113	107	—	—	55	41	2	—	—	
Received since ...	16	53	13	2	2	—	—	—	—	—	—	—	
	58	220	370	115	109	—	—	55	41	2	—	—	
Sent out during month	18	42	125	10	8	—	—	15	—	—	—	—	
On charge	40	178	245	105	101	—	—	40	41	2	—	—	
"M.O." ACCOUNT.													
On charge, 1st Jan., 1902	31	3	28	20	7	2	4	12	14	8	1	4	2 Sunshine Recorders. 5 Spheres. 1 Hygrograph.
Received since ...	4	—	13	—	—	—	7	—	—	—	—	12	1 Barograph.
	35	3	41	20	7	2	11	12	14	8	1	16	
Sent out during month	7	—	19	3	1	1	2	4	7	1	—	1	1 Barograph. 1 Sunshine Recorder. 1 Sphere.
On charge	28	3	22	17	6	1	9	8	7	7	1	15	1 Sunshine Recorder. 4 Spheres. 1 Hygrograph.

13th February, 1902.

R. F. WALLACE.

248. *Fog Inquiry.*—Submitted the following report :—

Since the 17th January the time has been chiefly occupied in visiting the various stations and impressing upon the observers the necessity of careful observations on the density of fog, and of the direction of light airs during fogs.

Bethnal Green and Rushey Green stations have been supplied with Wet and Dry Bulb Thermometers for two hourly reading.

It is desirable to have observations from near Erith, between Woolwich and Gravesend. The staff of the training ship "Cornwall," at Purfleet, were unable to be of assistance to this Office. The Metropolitan Asylums Board have been approached in the hopes that observations might be noted at the Small-pox ships opposite Purfleet, but owing to the present strain upon their staff it is unlikely that they will accede.

Comparisons of temperatures over the London district have been begun, and some considerable standing differences are to be found, whilst there are occasionally startling changes in one district or another, which seem to be correct and not instrumental—

Thus on 13th February at 9 a.m.	Christchurch Yard showed		29·8°
" " "	Sanderstead, 320 ft. "		21·8°
Thus on 15th January at 3 p.m.	Christchurch "		38·5°
" " "	Battersea Park "		34·0°
Thus on 18th January at 9 p.m.	Victoria Tower and St. Paul's showed ...		39·6°
" " "	Camden Square, Regent's Park, and Battersea showed		33·2°

The normal condition in January seems to be that Christchurch Yard and Battersea show similar temperatures, Camden Square and Regent's Park show 1·5° less, Sanderstead, Capt. Carpenter's, shows a further fall of 1·5°.

Victoria Tower, 300 ft., at	9 a.m.	shows	1·9° lower than Christchurch.
" "	3 p.m.	"	2·0° " "
" "	9 p.m.	"	the same as Camden Square.
" "	9 p.m.	"	0·3° lower than Regent's Park.

The thermograph on St. Paul's agrees with that on Victoria, with occasional sudden differences.

Between the 28th January and 4th February the minimum thermometer on St. Paul's fell to 16·5°. The nearest approximation to this was in Regent's Park, 7 a.m., 29th—23·0°.

St. Paul's and Westminster Tower have been visited weekly, and observations for visibility made. The instruments are working well.

The first fog of any considerable density since the 23rd December occurred on the 12th instant, and the records should prove interesting when discussed.

On days of clear blue sky in the country, if the temperature is not excessively low, the sun seems to have power to dissipate the fog by 1 p.m. in December and January. Even then the thick smoky fogs linger in a few localities until blown away. Fogs seem to increase from clearness so gradually that an observer is often hardly conscious of the time it began. On the other hand it dissipates quickly before a rising breeze or a hot sun.

Taking the sun's altitude at the longest day in London as 62° at noon and as 15° on the shortest day we get an intercepting medium on the shortest day for the sun's rays to pass through $3\frac{1}{2}$ times as thick as that on the longest day.

A record is being kept of the days of the week on which fogs of all kinds are most prevalent. Up to the present Friday takes the lead, then Saturday.

Kingsland (N.E.) shows more fog than any other locality.

Some observations of river temperature taken at Greenwich for Sir G. Airy in the years 1844–79, and compared with the land temperature, seem to point to very little influence on fog formation by change of temperature in the river water.

At Blackfriars Bridge during the last four weeks the temperature of the river surface has fallen steadily about 2° a week, but there have been no sudden changes, and this fall is probably due to the long-continued general low temperature. The river surface is now only 36°. The greatest variation in one day has been 4°.

ALFRED CARPENTER, R.N.,
Conducting Inquiry.

14th February, 1902.

249. Submitted—The following memorandum for use in reply to inquiries respecting appointments on the Office Staff :—

METEOROLOGICAL OFFICE.

Appointments on the Clerical Staff.

The clerical work of the Office is carried out by clerks on the staff, boy clerks, and female clerks.

The staff clerkships, which are in four grades, are intended for men who are able to undertake work of a technical and responsible character which could not be undertaken by boys.

In selecting candidates for appointment the Council will have regard to special knowledge and qualifications under the following headings as well as to general competence, good character, good handwriting, &c. :—

(1) General Meteorology and Geography.

(2) Ocean Meteorology and Practical Navigation.

(3) Foreign Languages.

(4) Telegraphy.

(5) Shorthand, Typewriting, Book-keeping.

(6) Arithmetical Computation, including the use of tables and formulæ, and of calculating machines and apparatus.

(7) Draftsmanship.

(8) The construction and use of Meteorological Instruments.

The qualifications of candidates with regard to one or more of the special subjects mentioned will be considered according to the duties of the post to which the Council intend to appoint.

Boy clerks have no claim to appointment as staff clerks, nor have staff clerks any claim, by seniority or otherwise, to promotion to higher grades on the staff; but in selecting candidates the Council give a preference to a candidate who has, in addition to the necessary special qualifications, a record of meritorious service in the Office.

The salaries of the different grades of clerkships are as follows :—

Class I.—£225 to £275.	Class III.—£125 to £150.
Class II.—£175 to £200.	Class IV.—£75 to £110.

In exceptional cases the maximum for a first-class clerkship may be raised to £300.

The Office hours are from 9 a.m. till 5 p.m. (1 p.m. on Saturdays, unless there is work requiring immediate attention). For those belonging to the Forecast Branch the hours of attendance are 8 a.m. to 4 p.m., and 1.30 to 8.30 p.m. in alternate periods.

The holidays are three weeks in the summer and eight days, in addition to the usual public holidays.

By a scheme of superannuation recently established, superannuation allowances are granted, which depend upon the number of years of meritorious service in the Office. The maximum allowances do not exceed one-half of the average salary of the retiring clerk for the three years preceding his retirement.

Approved.

250. Submitted—The following statement of accounts :—

Cash balance on 30th January	£6,311	1	6
Receipts from 31st January to 13th February ...	47	19	1
	6,359	0	7
Cheques drawn from 31st January to 13th February	906	10	0
Cash balance on 13th February	£5,452	10	7

251. Submitted—The following list of publications which had been received since the last meeting :—

Bell, Arthur H.—The flight of a hailstone.

Bergholz, P.—The hurricanes of the Far East. By Prof. Dr. P. Bergholz. English translation revised by Dr. Robert H. Scott.

Berne, Eidgenössisches Oberbauinspectorat, Hydrometrisches Bureau.—Tabellarische Zusammenstellung der Haupt-Ergebnisse der Schweizerischen hydrometrischen Beobachtungen. 1894.

British New Guinea.—Annual report on British New Guinea. 1899-1900.

London, Board of Trade, Commercial, Labour, and Statistical Department.—Statistical tables relating to the Colonial and other possessions of the United Kingdom. Part 23, 1897-98.

——— *Admiralty, Hydrographic Department.*—Arctic pilot, vol. 2. Sailing directions for Færoe Islands, Iceland, Greenland Sea, Spitzbergen, and the East Coast of Greenland.

——— *Meteorological Office.*—Report of the Meteorological Council for the year ending 31st of March, 1901 . . . .

Ottawa, Geological Survey of Canada.—General index to the Reports of Progress. 1863-1884. Compiled by D. B. Dowling.

Paris, Service Hydrographique de la Marine.—Annales hydrographiques. 2e sér. Tome 23, 1901.

Tyrer, R.—The meteorology of Cheltenham. Abstract of meteorological observations taken at the Observatory, Prestbury Road, Cheltenham, during 1901.

Wilks, Sir Samuel.—The history of Fahrenheit's thermometer.

63, *Victoria Street, S.W., February* 28, 1902.

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.
PROFESSOR DARWIN. | THE HYDROGRAPHER.
MR. SHAW (*Secretary*).

252. The Minutes of the last meeting (14th February) were read and confirmed.

253. *Meeting of the International Committee.*—The Secretary reported that the Committee had decided to hold its next meeting in 1903, in the same town as the Meeting of the British Association (Southport) in the second week in September.

254. *Volunteer Observers and Actions at Law.*—Read—Letter M.O. 281 from Mr. H. M. Freear, who had been summoned from Woburn at an inconvenient time to give evidence in a trial at the Bedford Assizes because a copy of the Woburn observations had been supplied by the Office and were required by the Judge to be attested by the Observer before being accepted as evidence.

It was resolved that no action could be taken in the matter and that the practice of the Office should continue as heretofore.

255. *Monthly Weather Report* (Minute 56).—A revised form of the Monthly Summary, incorporating observations at Second Order stations with those from Telegraphic stations, was submitted and approved.

256. *Instruments—Breakage of Barometers in Transit.*—Submitted—A memorandum reporting that since March 1900, 14 Mercurial Barometers, Admiralty pattern, had been broken in transit either by rail or steamer; 11 of these were being sent to Cape of Good Hope Yard, 2 to Portsmouth, and 1 to Malta. The Secretary submitted also a form of barometer case, devised by Mr. R. Curtis, in which the instrument is supported on india-rubber packing.

It was resolved that trial be made of sending barometers in cases arranged in manner exhibited, the cases to be packed in wicker hampers to contain four instruments and surrounded, in the hamper and outside it, with elastic packing.

257. *Pilot Charts.*—The Secretary was authorised to present the surplus copies of the issue of Pilot Charts for the year ending 31st March, 1902 (Minute 186), to schools, at his discretion.

Authority was given for the continuation of the issue of the Charts for the ensuing year.

258. *Lighthouse Register.*—Submitted—Copy for revised form of Lighthouse register upon re-issue.

The Secretary was authorised to obtain proofs.

259. *Storm Warnings — Castle Townshend.*—Reported—That a storm warning telegram sent to Castle Townshend had been reported undelivered because the Harbour Board which took charge of the signals had been dissolved.

It was resolved to apply to the Admiralty for the signals to be hoisted at the Coastguard Station.

260. *Storm Warnings — Bidston Observatory.* — Read — Letter M.O. 312 from Mr. W. E. Plummer offering to send "a report of the Anemograph register on every occasion on which warnings are issued from your Office, or reports when the wind registers 60 or more miles (nominal) on the Robinson or same number on Dines."

It was agreed to accept Mr. Plummer's offer, with thanks.

261. Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of January, 1902 :—

The letters used have the following signification :—

a = complete success. | c = partial failure.
b = partial (*i.e.*, more than half) success. | d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	39	61	50	86
"	b	42	29	36	
"	c	13	7	10	
"	d	6	3	4	
Scotland, E.	a	39	49	44	73
"	b	22	35	29	
"	c	26	13	19	
"	d	13	3	8	
England, N.E.	a	42	65	54	86
"	b	39	26	32	
"	c	19	3	11	
"	d	0	6	3	
England, E.	a	68	65	67	92
"	b	16	35	25	
"	c	13	0	7	
"	d	3	0	1	
Midland Counties	a	58	65	62	84
"	b	16	29	22	
"	c	13	6	10	
"	d	13	0	6	
England, S.	a	71	71	71	96
"	b	26	23	25	
"	c	3	6	4	
"	d	0	0	0	
Scotland, W.	a	65	87	76	89
"	b	19	7	13	
"	c	16	3	10	
"	d	0	3	1	
England, N.W.	a	45	68	57	81
"	b	23	26	24	
"	c	29	6	18	
"	d	3	0	1	
England, S.W.	a	58	77	68	95
"	b	32	23	27	
"	c	10	0	5	
"	d	0	0	0	
Ireland, N.	a	29	68	49	81
"	b	42	23	32	
"	c	10	9	10	
"	d	19	0	9	
Ireland, S.	a	26	65	46	81
"	b	39	32	35	
"	c	22	3	13	
"	d	13	0	6	
SUMMARY.					
British Islands	a	49	68	59	86
"	b	29	26	27	
"	c	16	5	11	
"	d	6	1	3	

262. *Storm Warnings.*—Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the Coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on six days, the total number of districts warned being 27.

In five districts the warnings were justified by subsequent gales (force 8 and upwards) and in 10 districts by subsequent strong winds (forces 6 and 7). In 12 districts they were not required.

GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

263. Read—A memorandum from the Marine Superintendent stating that since the last meeting 11 logs had been received, two of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

264. *Messengers.*—Reported—That Commissionaire Annan had been sent by the Commandant to replace Commissionaire T. Morgan, who had resigned upon receiving an appointment at Windsor.

265. Submitted—The following statement of accounts :—

Cash balance on 13th February	£5,452	10	7
Receipts from 14th to 27th February	24	2	6
	5,476	13	1
Cheques drawn from 14th to 27th February ...	214	10	7
Cash balance on 27th February	£5,262	2	6

266. Submitted—The following list of publications which had been received since the last meeting :—

Calcutta, Meteorological Office, Bengal.—Meteorological summary for the monsoon period of 1901.

Hamburg, Deutsche Seewarte.—Deutsches meteorologisches Jahrbuch für 1900. Beobachtungs-System der Deutschen Seewarte. Ergebnisse der meteorologischen Beobachtungen . . . . Jahrg. 23.

Hollesley Bay, Colonial College.—Summary of meteorological observations taken at the Colonial College, 1901.

Hong Kong Observatory.—China Coast meteorological register, 1901.

Jersey, Observatoire St. Louis.—Bulletin des observations magnétiques et météorologiques. 8e année, 1901.

Lamb, Edmund.—Climatological observations, taken at Borden Wood, in the Parish of Chithurst, County of Sussex, during the year 1901.

Olbeter, J.—Rain and snow. How much falls at Davos ?

Perth, Department of Lands and Surveys.—The land selectors' guide to the Crown lands of Western Australia.

Tyndall, W. H.—Meteorology, Oxford Road, Redhill, for the year 1901.

Washington, Department of Agriculture, Weather Bureau.—Meteorological chart of the great Lakes. Summary for the season of 1901. No. 2, 1901.

Washington, Smithsonian Institution.—Smithsonian miscellaneous collections. Vol. 42.

Watzof, Spas.—Folk-meteorology. A collection of Bulgarian weather proverbs and weather rules.

63, *Victoria Street, S.W., 14th March*, 1902.

PRESENT :

THE HYDROGRAPHER, IN THE CHAIR.

MR. BUCHAN. | MR. SHAW (*Secretary*).

267. The Minutes of the last meeting (February 28th) were read and confirmed.

268. *International Weather Telegrams.*—The Secretary reported that in correspondence with the Secretary of the International Committee (P.C. 2,666) he had suggested, with the view of obviating incidental causes of delay in transmission, that the offices of the different countries should make a monthly return of the times of arrival of telegrams to the several offices controlling the stations reporting the observations; that the suggestion had been adopted by the Committee and returns for January and February had been sent and received in accordance therewith, which included the following results :—

SHORTEST INTERVAL from the TIME of OBSERVATION to the RECEIPT of TELEGRAMS in the months of January and February, 1902.

From the British Isles to the Continent :—

7h. a.m. observations	... To Hamburg	... 25 min.
Do.	... To Holland	... 56 min.
Do.	... To Holland *viâ* Hamburg	... 2 hrs. 15 min.
Do.	... To Hamburg *viâ* Holland	... 40 min.
8h. a.m. observations	... To Holland	... 1 hr. 15 min.
Do.	... To Belgium	... 1 hr. 13 min.
Do.	... To Hamburg	... 1 hr. 30 min. to 2 hrs. 30 min.
Do.	... To France	... 1 hr. 26 min.

From Abroad to the Meteorological Office :—

Sweden (7h. a.m.)	... 1 hr. 48 min.
Norway (7h. a.m.)	... 1 hr. 46 min.
Denmark (7h. a.m.)...	... 1 hr. 46 min.
Germany (7h. a.m.)...	... 1 hr. 17 min.
France (6h. 51m. a.m)	... 1 hr. 10 min. to 2 hrs. 55 min.
Holland (8h a.m.)	... 58 min.
Belgium (8h. a.m.)	... 1 hr. 25 min.
Spain (9h. 25m. a.m.)	... 4 hrs. 45 min.
Portugal (9h. 36m. a.m.)	... 2 hrs. 22 min.
Delgada (?)	... [2 hrs. 24 min.]

The Secretary was authorised to continue the returns.

269. *Pilot Charts.*—Submitted—The following memorandum by the Marine Superintendent :—

MEMORANDUM RELATING TO PILOT CHARTS.

The North Atlantic Pilot Charts are sent from the Stationery Office to the Storekeeper at Poplar about the middle of the month preceding that to which they refer, and from Poplar they are distributed to the various Mercantile Marine Offices. The copies remaining are returned to Poplar when the charts for the following month are distributed.

It is suggested that the charts should be obtainable at the Mercantile Marine Offices at least to the end of the month to which the charts refer, and that official copies presented to observers should be sent direct from this Office, instead of being distributed by means of orders on the Superintendents of Mercantile Marine. For this purpose the number of official copies supplied to the Office would have to be increased.

Owing to the charts not having been advertised, except in the "Notice to Mariners," they are very little known amongst shipmasters and officers, other than those who keep observations for this Office. Weather charts for sale by the Admiralty Agents would appear on their advertisement lists. In addition to an increase in their sale they would become more widely known. It would also be an advantage to have printed a sheet advertisement, similar to the one relating to the supply of "Weather Information" displayed at Post Offices, for prominent exhibition at Mercantile Marine Offices and other places frequented by seamen.

The Superintendent of the Mercantile Marine Office at Avonmouth, near Bristol, in a letter dated the 5th ultimo, states that he requires four official and two sale copies of the Pilot Charts to be forwarded to him monthly.

There being a regular line of streamers to and from Avonmouth keeping logs for the Office, it is proposed to include Avonmouth in the supply of sale and ? official copies.

With the object of reducing the expenditure on postage, it is further suggested that the charts forwarded from this Office to the usual recipients of Meteorological Office publications and to others, be sent folded, in a large envelope, instead of rolled, excepting in those cases where cylinders are used.

Two charts are submitted that have been forwarded to and from Ealing, one of them in an envelope, the other rolled.

As few or no orders upon the Superintendents of the Mercantile Marine have hitherto been given for any offices excepting Bristol, Glasgow, Hull, Liverpool, London (Dock Street, Poplar, Victoria Docks, and Tilbury), Manchester, and Southampton, it may not be necessary in future, in the event of the present system being continued, to send official copies to the other ports. When necessary the few copies required for these ports can be sent direct from the Office.

A statement as to the number of copies printed each month, their distribution and sale, &c., is herewith submitted.

C. H.

March 8th, 1902.

Also the following statement from the Stationery Office supplied by the Superintendent of Publications with letter M.O. 515 :—

STATEMENT showing number of PILOT CHARTS printed, sold by Agents and Board of Trade, and used officially by Board of Trade, Meteorological Office, and Stationery Office, with balance on 13th March, 1902 :—

—	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.	No. 9.	No. 10.	No. 11.	No. 12.
Number printed	1,010	1,000	1,012	705	707	709	606	603	603	610	608
Sold by—											
Agents :—											
England	22	21	22	22	15	17	20	18	19	23	21
Scotland	18	23	23	23	23	22	22	22	22	20	20
Ireland	—	—	—	—	—	—	—	—	—	—	—
Board of Trade	78	41	44	68	50	31	24	29	22	27	30
Official use.											
Board of Trade*	350	260	260	150	150	175	160	160	160	160	160
Meteorological Office*	200	180	180	200	200	200	200	200	200	200	200
Stationery Office	5	5	5	5	5	5	5	7	5	5	15
Balance	337	470	478	237	264	259	175	167	175	175	162

* NOTE.—The distribution of the official copies has been as follows :—

Presentation copies (M.O. List)	147	147	150	151	151	151	150	153	153	138	134
„ „ (Observers per M.O.)	46	41	36	30	25	21	21	29	79	61	103
„ „ (Observers per M.M.)	64	62	78	44	29	49	20	42	38	58	41
Distributed to training ships, &c. ...	270	138	138	107	125	120	150	120	85	75	70
Total remainders	607	608	616	344	389	379	325	287	260	250	232
Presentation copies for observers authorised by orders.	94	138	127	115	111	88	96	113	177	140	154
„ „ unclaimed	30	76	49	71	82	39	76	71	139	82	113

M.O. 515.

H.M. Stationery Office,
Publications Branch,
13th March, 1902.

DEAR MR. SHAW,

I AM now able to send you the promised return of the issues for various purposes of the Pilot Charts. The result of the sales can scarcely be looked upon as encouraging?

I should say that we ought not to print more than 500 of No. 13, and that the original issues to Board of Trade for sale and official use should be reduced as they always return considerable numbers.

Yours faithfully,
J. J. ANDERSON.

W. N. Shaw, Esq.

The Hydrographer undertook to consult the Agent for the sale of Admiralty publications with respect to arrangements for the sale of the Charts and it was agreed that in the meantime it was not desirable to reduce the number printed. It was also resolved that presentation copies for observers should be sent by post from the Office folded in envelopes instead of being distributed through the agency of the Mercantile Marine Offices of the Board of Trade, and that the paper selected for printing should be suitable for this mode of distribution.

270. *Storm Warning Signals after Dark* (Minute 181).—The Secretary reported the result of the inquiry as to the provisions for signals after dark as follows:—

Number of stations having storm signals (say) = 244.

Replies have been received from 161 stations and letters from Lloyd's, The Mersey Docks and Harbour Board, The Irish Lights, and Trinity House with reference to their stations. No reply has been received from the Scottish Lighthouse Board (*see* Letter of inquiry, 19th December, 1901), nor from 26 other stations to which the Circular was sent.

No provision is made either for night signals or for the illumination of the canvas cone except at 11 stations as detailed below:—

Aberdeen.—"The cone can be seen at night by the electric lights being so close to the mast on which hoisted."

Belfast.—"Owing to the harbour being well lighted by electricity the cones are easily seen at night."

Devonport.—"Arrangements have been made to use the night signals in future."

Hastings.—"Corporation have made provision for signalling after dark."

Leith.—"Provision is made for signalling after dark."

Limerick.—"Signals can be seen at night time by their position near electric lights."

Middlesbrough.—"During the night an arc-lamp is kept alight within a few feet of the cone, and there is no difficulty in seeing it."

Newhaven (Edinburgh).—"After dark the storm warnings are exhibited at the Tower at Leith."

Newhaven (Sussex).—"Red globular lamps are provided for use after dark."

Portknockie.—"A green light is hoisted during the night."

Southport.—"The cone mast is erected in the vicinity of powerful electric arc lights, and the cone can readily be seen after dark."

271. *London Fog Inquiry* (Minute 248).—Submitted the following report:—

15th March, 1902.

Since the 12th February opportunities for fog study have increased owing to the occurrence of several moderately dense fogs, but the opportunities lost in October and November can not be made up for in the spring.

By further comparisons of temperature between the instruments on Victoria Tower Westminster and those on the ground it appears that the temperature of the atmosphere at that height during winter months is roughly 2° lower at 9 a.m. and at 3 p.m., and 1° lower during the night hours, comparisons being made at 9 p.m., midnight, 3 a.m., and 6 a.m. by thermograph curves.

Comparisons of temperature about the London District have been continued and irregularity has been found to frequently precede formation of fog.

St. Paul's Cathedral and Westminster Tower have been visited once a week to inspect instruments and to make notes on visibility. Days of fog have not been purposely chosen but it has been

found that since the 20th December the atmosphere has been so full of rising smoke that on only one occasion has one of these elevated positions been seen from the other, and then faintly, although the distance between them is but 1½ miles.

The average visibility from notes made on 25 occasions of ascending these towers is ½ mile, and the extreme distance at which objects have been visible is 1½ miles.

The Fire Brigade Stations have been desired from time to time when anti-cyclonic conditions prevail to send in two-hourly returns of the characteristics of fog then prevailing. In such cases the direction of light airs has been estimated by the general trend of smoke from high chimneys. It is found that a complete calm seldom occurs. There is usually a main current of air from some direction. But it is found that where the current is slight there is a distinct indraught towards the central part of London, and, on occasions of no general stream of air, that the light currents blow direct towards such centre.

The relation of fog density in certain parts of London is now being discussed with regard to these movements.

Captain Carpenter took leave of absence for one week from 22nd February owing to a bronchial attack. On return the records at Kew of visibility were examined and notes made from them of fog frequency.

A curve of fog frequency has been drawn up for the years 1844 to 1879 from Sir G. Airy's observations at Greenwich. The curve shows a rapid rise from 15th August to 13th November followed by a rapid fall to 15th January, then by a gradual decrease to 15th March followed by a rapid fall to middle of April.

From 1st May till end of July fogs are comparatively rare. This has been checked by observations at Kew from 1884 to 1901. The maximum frequency at Kew, however, took place in December for these years.

As the period of fog frequency is now approaching its minimum I would suggest that the observations for this winter be brought to a close at the end of March, and that if further inquiry is to be made that observations should begin again about the 20th August next.

The thanks of the Council should be sent to the various observers for the work done.

If the Council desires it I am willing to work up results in my own house and make a report without further remuneration, and I shall be in a better position to discuss results when free from the administration of this office.

Should no considerable advance in the possibility of forecasting occurrence of fog and of fog movement be arrived at there will yet have been collected much meteorological data for the district of London that may in the future be of value in similar investigations.

ALFRED CARPENTER, R.N.

Resolved—That in accordance with Captain Carpenter's suggestion the observations be brought to a close at the end of March; that Captain Carpenter's appointment be continued until the 10th April and that his offer to work up the results in his own house be accepted with thanks: that the special provision of clerical work in the Office in connexion with the inquiry (Minute 153) cease on 12th April.

272. *Suggested Shortened Form of Log* (Minutes 125, 144, 182).—A final proof was submitted and approved.

273. *Logs.*—Read—A memorandum from the Marine Superintendent stating that since the last meeting two logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

274. *Storm Warnings.*—Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council:—

WARNINGS ISSUED.

The signals were hoisted on three days, the total number of districts warned being eight. In three districts the warnings were justified by subsequent gales (force 8 and upwards), and in two districts by strong winds (force 6 or 7). In three districts they were not required.

GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

14th March, 1902. FREDC. GASTER.

275. *Forecasts.*—Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of February, 1902 :—

The letters used have the following signification :—
a = complete success
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success. a + b.
Scotland, N.	a	57	71	64	91
"	b	25	29	27	
"	c	14	0	7	
"	d	4	0	2	
Scotland, E.	a	43	64	54	86
"	b	36	29	32	
"	c	11	7	9	
"	d	10	0	5	
England, N.E.	a	68	54	61	90
"	b	21	36	29	
"	c	11	10	10	
"	d	0	0	0	
England, E.	a	43	46	45	86
"	b	46	36	41	
"	c	4	7	5	
"	d	7	11	9	
Midland Counties	a	43	57	50	86
"	b	39	32	36	
"	c	11	4	7	
"	d	7	7	7	
England, S.	a	39	57	48	86
"	b	39	36	38	
"	c	18	4	11	
"	d	4	3	3	
Scotland, W.	a	61	89	75	91
"	b	21	11	16	
"	c	14	0	7	
"	d	4	0	2	
England, N.W.	a	61	50	56	83
"	b	18	36	27	
"	c	18	11	14	
"	d	3	3	3	
England, S.W.	a	46	54	50	88
"	b	36	39	38	
"	c	11	7	9	
"	d	7	0	3	
Ireland, N.	a	43	57	50	93
"	b	50	36	43	
"	c	4	7	6	
"	d	3	0	1	
Ireland, S.	a	54	68	61	84
"	b	21	25	23	
"	c	14	7	11	
"	d	11	0	5	
SUMMARY.					
British Islands	a	51	61	56	88
"	b	32	31	32	
"	c	12	6	9	
"	d	5	2	3	

276. *Office Staff.*—It was agreed that the salary of the Marine Superintendent be increased to £400 per annum from April 1st, 1902.

277. *Office Staff.*—The Chairman and Secretary were authorised to select a candidate for appointment as Scientific Assistant to the Secretary in accordance with the terms of the following memorandum :—

METEOROLOGICAL OFFICE SECRETARY'S SCIENTIFIC ASSISTANT.

The Meteorological Council are prepared to appoint an assistant to the Secretary.

The assistant will be required to attend at the Office or elsewhere at such times as the Secretary may from time to time direct.

His duties will be mainly in connexion with scientific investigation. He will be expected in the first instance to carry out such investigations as the Secretary may direct with reference to forecasts of weather, and he must be prepared to attend at the Office from the times of daily observations at reporting stations (8 a.m. or possibly 7 a.m.) when required to do so. He may also be called upon to assist the Secretary in any other manner.

He will not, however, be expected to take part in the administration of the Office. In the absence of the Secretary the Marine Superintendent will be in charge of the Office as heretofore, and in the absence of both the Secretary and Marine Superintendent, the Chief Clerk.

The appointment will be in the first instance for one year on probation at a salary of £200, and if re-appointed the salary for the second year will be £300.

The Council will afford reasonable facilities for the assistant to undertake lectures or experimental work in connexion with meteorological investigation provided these do not interfere with his work for the Office.

Six weeks holiday in the year will be given as a rule, in addition to the usual fixed holidays (bank holidays, King's birthday, &c.) of a public office.

278. *Reports of Work for February :—*

MARINE BRANCH.

March 13th, 1902.

Examined 10 new logs and three lighthouse registers.

District south of the equator, between the west coast of Africa and 90° W. longitude. Adding isobars and notes on the winds and seasons to the monthly charts for the coastal regions of South America and revising charts as received from Admiralty.

Indian Ocean District—from latitude 30° N. to 30° S. Preparing and extracting data in Office logs.

Preparing copy of sea temperature charts for Atlantic, Indian, and Pacific Oceans for photo-lithography, for re-issue of official publication, No. 59.

Monthly Pilot Charts of the North Atlantic and Mediterranean—March chart passed for press; April chart in hands of the lithographer. Preparing chart for May. Obtaining sea temperature results for January, and wind and fog results to north of 50° N. latitude for April. Registering and acknowledging reports of ice and sea temperatures and issuing further supplies of forms.

Sailing directions for China Sea and South America—Obtaining results of meteorological observations at several places for publication in new issue.

Mr. Carter returned to work on February 17th, having been absent on sick leave from January 7th.

CAMPBELL HEPWORTH.

FORECAST BRANCH.

Daily Weather Report.—All numbers issued promptly. *Monthly Correction Sheet*, January, completed, not issued.

Weekly Weather Report, 1902.—Our portion all completed and handed in promptly.

Monthly Summary.—December, completed and gone to press; January, copy gone to printer.

Storm Warnings, 1902.—Primary checking, done to date, promptly; final checking, 1901, commenced.

Forecast Checking, 1902.—January, done and handed in; February in hand.

Tabulation of Anemometry.—Six months of Deerness done and handed in.

FREDC. GASTER.

Observatory Branch.

Hourly Means.—Volume for 1899.—The various tables of mean results for Fort William Observatory have been completed, and the calculation of those for Aberdeen is now in hand. The results for Valencia are being copied for press and are nearly ready to be sent.

Mean Temperature Tables for the British Isles.—Proof has been revised and signed for press up to page 104, the revision of the remaining 16 pages to complete the work is now in hand. The Introduction to the work has been further revised and, together with the plates, has been passed for press.

Examination of Observatory Work.—Nothing has been done under this head beyond the first examination of the curves upon their receipt.

Miscellaneous.—Prepared a diagram of pressure at, and of temperature over, Paris, February, 1901.

Made a copy of Strathpeffer sun record for January to return to observer.

Documents and curves re-arranged in Room 9.

St. Helena anemograms July–December, 1898, tabulated.

All anemograms for 1897, 1898, and 1899 examined, arranged, and sent to binder.

Copies made and sent to Prof. Hergesell of the observations on Ben Nevis for three days in January.

Inquiries.—Mr. Mawley—Temperature and rainfall at Kew Observatory during 1901.

St. George's Infirmary—Copy of Kew Weather Register for one week, November, 1901.

Mr. Marriott—Temperature at Kew at end of January and beginning of February, 1902.

R. H. Curtis.

Statistical and Library Branch.

1. Issue of Publications :—

Daily and weekly publications regularly issued.

Monthly summary of the Weekly Weather Report for November, 1901, received and issued.

Pilot Charts for March, 1902, received, and 185 copies issued; also 101 copies for other months issued.

Presentation copies of publication, 36 in all, issued to Captains and Officers of ships and others.

Annual Report for 1900–1901 received, and 450 copies issued.

2. Statistical and Station Work :—

Tables for weekly issues of the "Weekly Weather Report" prepared to date.

Tables and working maps for Monthly Summary of the Weekly Weather Report for January, 1902, prepared and sent to printer. Some time occupied in the re-arrangement of this publication, and the inclusion in it of returns from certain selected stations of the Second Order.

Preface, with list of Observers, &c., to the Weekly Weather Report for 1901, prepared and sent to the printer.

Ten-day means for certain stations supplied to Dr. Neumayer, Hamburg, to date.

Results for Registrar General's (Ireland) weekly reports regularly supplied.

Returns from Stations of the Second Order for 1899 proceeded with, and 32 pages sent to the printer.

Appendix III. to the Weekly Weather Report for 1901, containing the means, values, and extremes for stations included in the Report partly prepared for the printer.

3. Library :—

Accessions to library received and catalogued as reported in Minutes.

4. Inquiries:—

During February there were nine inquiries by letter, 33 personal inquiries for forecasts or other weather information (in nine of which payment was made for the information supplied), and six inquiries by telegraph.

I attended, under subpœna, at the Bedford Assizes on February 1st and 3rd to give evidence as to wind force at Bedford in December, 1900.

John A. Curtis.

MONTHLY RETURN OF "A" AND "M.O." INSTRUMENTS ON CHARGE.

February, 1902.

——	Barometers.	Aneroids.	Thermometers. Ordinary.	Thermometers. Maximum.	Thermometers. Minimum.	Thermometers. Solar Radiation.	Thermometers. Terr. Radiation.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
"A." ACCOUNT.													
Dr.													
On charge, 1st Feb., 1902	40	178	245	105	101	—	—	40	41	2	—	—	
Received since ...	12	1	6	1	—	—	—	30	—	—	—	—	
	52	179	251	106	101	—	—	70	41	2	—	—	
Cr.													
Sent out during month	3	—	20	—	—	—	—	15	—	—	—	—	
On charge, 1st Mar., 1902	49	179	231	106	101	—	—	55	41	2	—	—	
"M.O." ACCOUNT.													
Dr.													
On charge, 1st Feb., 1902	28	3	22	17	6	1	9	8	7	7	1	15	1 Sunshine Recorder. 4 Spheres. 1 Hygrograph.
Received since ...	8	—	20	2	—	6	3	—	9	—	—	—	1 Barograph. 2 Sunshine Recorders.
	36	3	42	19	6	7	12	8	16	7	1	15	
Cr.													
Sent out during month	18	—	39	3	2	2	4	4	9	2	—	—	1 Sunshine Recorder. 1 Sphere.
On Charge 1st Mar., 1902	18	3	3	16	4	5	8	4	7	5	1	15	2 Sunshine Recorders. 3 Spheres. 1 Barograph. 1 Hygrograph.

13th March, 1902. R. F. WALLACE.

279. *Instruments.*—Submitted—The following:—

RETURN of ADMIRALTY INSTRUMENTS in the OFFICE and at HIS MAJESTY'S DOCKYARDS, for QUARTER ending December 31st, 1901.

Place and Date.	Particulars.	Barometers. Mercurial.	Barometers. Aneroid.	Thermometers. Ordinary.	Thermometers. Max.	Thermometers. Min.	Thermometers. Screens.
Meteorological Office.	Available 1st Oct., 1901	52	91	10	22	18	48
	Received, new	—	90	348	85	76	—
	„ repaired, cleaned.	37	25	26	1	—	—
	Total	89	206	384	108	94	48
	Issued	23	29	69	22	22	4
	Total available 1st Jan., 1902	66	177	315	86	72	44

RETURN of ADMIRALTY INSTRUMENTS for the QUARTER ending 31st December, 1901.

Depôts.	BAROMETERS.								THERMOMETERS.															
	Mercurial.				Aneroid.				Ordinary.				Maximum.				Minimum.				Screens.			
	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.	Est.	Store.	Surplus.	Shortage.
Portsmouth	25	23	—	2*	55	52	—	3	150	149	—	1	50	52	2	—	50	52	2	—	25	14	—	11
Devonport	25	22	—	3	55	41	—	14	150	134	—	16	50	53	3	—	50	47	—	3	22	21	—	1
Chatham	25	19	—	6*	55	45	—	10*	150	82	—	68*	50	32	—	18*	50	34	—	16*	25	2	—	23*
Sheerness	6	—	—	6*	15	3	—	12*	30	18	—	12*	10	7	—	3*	10	8	—	2*	10	7	—	3*
Queenstown	2	2	—	—	2	7	5	—	3	12	9	—	3	8	5	—	3	8	5	—	—	3	3	—
(Dockyards Home) Total	83	66	—	17	182	148	5	39	483	395	9	97	163	152	10	21	163	149	7	21	82	47	3	38
Gibraltar	2	2	—	—	2	—	—	2*	4	9	5	—	3	3	—	—	3	3	—	—	—	—	—	—
Malta	11	10	—	1*	15	13	—	2*	60	44	—	16*	10	11	1	—	10	10	—	—	1	2	1	—
Bombay	4	4	—	—	3	1	—	2	10	—	—	10	4	3	—	1	4	3	—	1	1	2	1	—
Halifax	3	3	—	—	4	1	—	3	20	19	—	1	4	1	—	3	4	1	—	3	1	2	1	—
Bermuda	3	4	1	—	4	5	1	—	20	16	—	4	4	4	—	—	4	5	1	—	1	2	1	—
Jamaica	3	3	—	—	2	4	2	—	10	10	—	—	2	—	—	2	2	1	—	1	1	1	—	—
Cape of Good Hope	7	5	—	2	8	7	—	1	33	29	—	4	8	10	2	—	8	6	—	2	2	2	—	—
Trincomalee	3	3	—	—	3	4	1	—	10	20	10	—	4	5	1	—	4	5	1	—	1	1	—	—
Hong Kong	17	13	—	4*	21	15	—	6*	87	—	—	87*	21	12	—	9*	21	16	—	5*	5	12	7	—
Coquimbo	2	2	—	—	4	3	—	1	15	18	3	—	2	3	1	—	2	4	2	—	1	1	—	—
Sydney	5	3	—	2*	6	8	2	—	25	19	—	6*	6	4	—	2*	6	5	—	1*	1	1	—	—
Esquimalt	4	3	—	1	5	8	3	—	15	19	4	—	2	2	—	—	2	2	—	—	1	2	1	—
(Dockyards Abroad) Total	64	55	1	10	77	69	9	17	309	203	22	128	70	58	5	17	70	61	4	13	16	28	12	—
Grand Total and Net Shortage at Depôts	147	121	—	26	259	217	—	42	792	598	—	194	233	210	—	23	233	210	—	23	98	75	—	23
Meteorological Office... ...	45	66	21	—	120	177	57	—	250	315	65	—	80	86	6	—	80	72	—	8	50	44	—	6
Repairing	—	—	11	—	—	—	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Returnable from Depôts ...	—	—	19	—	—	—	19	—	—	—	4	—	—	—	2	—	—	—	1	—	—	—	—	—
Ordered	—	—	20	—	—	—	19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Net Surplus or Shortage at M.O.	—	—	71	—	—	—	105	—	—	—	69	—	—	—	8	—	—	—	—	7	—	—	—	6
Proposed to be Ordered ...	—	—	—	—	—	—	—	—	—	—	144	—	—	—	16	—	—	—	30	—	—	—	30	—

6th March, 1902

* Supply forwarded since 31st December, 1901.

R. F. WALLACE.

Authority was given for ordering additional instruments as proposed.

280. Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 27th February	5,262	2	6
Receipts from 28th February to 13th March	272	14	4
	5,534	16	10
Cheques drawn from 28th February to 13th March ...	699	18	1
Cash balance on 13th March	£4,834	18	9